SLS-86
Solution

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SLS-86 – User Manual

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Attention!

You are handling dangerous electrical current!

- Disconnect the supply voltage before making any wiring modifications.
- Ensure that the system cannot be switched on accidentally.
- Ensure that the device and its surroundings are potential free.
- Please refer to the specific installation and mounting instructions.
- Qualified personal only should handle the device.
- The device has to be mounted in such a way that no unintentional operation may occur.
- All control and supply voltage wiring must be routed so that no inductive or capacitive interference or any other severe electrical noise disturbance may interfere with the device.
- Supply voltage variation must not exceed the specifications in the technical details. If so, proper performance of the device can not be guaranteed.
- Emergency installations according to EN60204/IEC204(VDE0113) must remain active in all modes of the automated installation. Activation of the emergency installation must not cause an uncontrolled or undefined start cycle.
- The software engineer has to make sure, that no failure functions of the automated installation may occur when line faults or core faults arise.
- Notwithstanding the above, local regulations must be observed in all installations.

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Solution SLS-86

Safety precautions

Danger to life through electrical current!
Only skilled personal trained in electro-engineering should perform the described steps in the following chapters. Please observe the country specific rules and standards. Do not perform any electrical work while the device is connected to power.

Pay attention to following rules

- ❑ Switch off the automated installation.
- ❑ Disable any automatic restart system
- ❑ Electrically isolate the installation
- ❑ Cover any non-isolated areas

Preface

The Hiquel Solution SLS (**S**mart **L**ogic **S**ystem) is a device from the new generation of HIQUEL products. SLS is designed to bridge the gap between low end control modules and specialised mini PLC's.

For this reason SLS will replace:

- **time relays**
- **counting functions**
- **time measuring functions**
- **electronic systems**
  and
- **complex or annual real time switching systems**

Simply draw a circuit diagram for your application on your PC and SLS will be ready to execute the tasks in a wide range of applications including the following:

Heating systems, control systems for lights, doors, roller shutters, car park barriers, blower and ventilation systems, revolving doors, automated machines and installations, presses, punches, belt conveyors, vibration conveyors, sorters, pumps, compressors, etc.

Module description

This chapter deals with the various SLS components.

Main module
SLS-86-R, SLS-86-S
4 digital inputs
4 digital + analogue inputs
6 digital outputs

Memory card
SLS-86-SIM
Read-Only-Memory (ROM) 8kb for SLS-86

Programming cable
SLS-86-CONN
Connection between PC (RS232) and SLS-86

Digital extension module
SLS-DR-C, SLS-DR-D, SLS-DT-C, SLS-DT-D, SLS-DS-C, SLS-DS-D
4 digital inputs
4 digital outputs (relay, transistor PNP, Solid-State)

PTC extension module
SLS-PTC-C, SLS-PTC-D
4 PTC (DIN 44081)
4 digital outputs (transistor PNP)

PT 100 extension module
SLS-PT100-C, SLS-PT100-D
2PT100 (-50°C to +300°C)
4 digital outputs (transistor PNP)

PT 1000 extension module
SLS-PT1000-C, SLS-PT1000-D
2PT100 (-50°C to +300°C)
4 digital outputs (transistor PNP)

Voltage input extension module
SLS-AI-C, SLS AI-D
4 analogue inputs (0-20mA or 4-20mA)
1 analogue output (0-10V)
4 digital outputs (transistor PNP)

Current input extension module
SLS-AU-C, SLS-AU-D
4 analogue inputs (0-10V)
1 analogue output (0-10V)
4 digital outputs (transistor PNP)

Bus terminator
SLS-86-BUS (for extension modules)

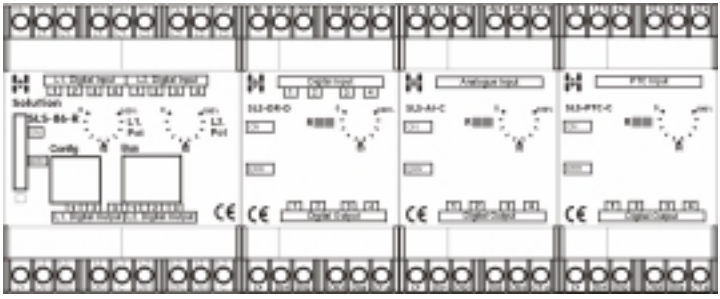
Technical information

Housing	67,5 x 85 x 70mm and 45 x 85 x 70mm
DIN rail mounting	35mm rail (EN 50022)
Safety	EN 60947-1/A2, housing IP50, terminals IP20
Wiring	max. 2x1,5mm² per terminal
Supply voltage	24VDC +/-10%
Memory card	8kByte SIMM Card
Programming port	external RS232 for connection with the PC
Connection between modules among each other	decentral with CAT5 connectors; central with side connection
LED-display	LEDs for digital in- and outputs, supply voltage OK, failure and information
Cycling time	constant 100ms
Timers	11 time functions; 32 timers; Real-Time-Clock with calendar;
Timer resolution	0,1s to 109min, two time ranges can be adjusted by potentiometer
Counter	32 counters, (8 non-volatile), Standard counters, 8 adjustable set points for each counter
Marker	64 Markers (functions: 16 x standard; 16 x rising edge, 16 x falling edge, 16 x rising and falling edge)
Special functions (program macros)	Local starter, remote starter (1, 2, & 3 DOL STARTER, STAR-DELTA STARTER, REVERSING CONTACTOR)
Programming software	Wiring diagram, SoftwirePLUS, Standards EN61082-2, 89/336/..., 73/23/...
Programming software platform	Windows95/98 or Windows NT/2000
Wiring diagram	Automatic wiring diagram check, printing options for the wiring diagram, a cross reference list and a connection diagram

Module connections

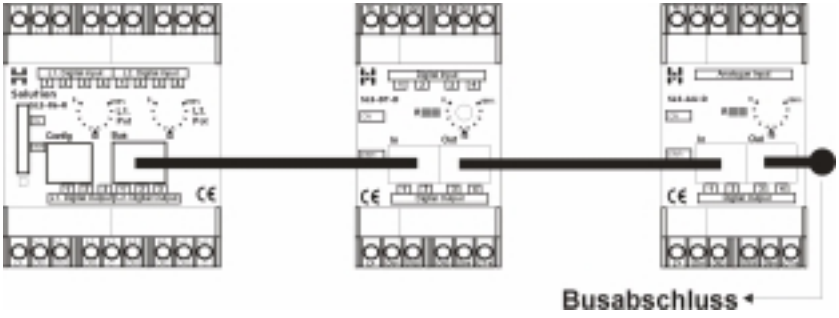
Extension modules must be connected in a series configuration. Although it is physically possible to branch to a parallel bus, this should not be tried. Central and decentral modules can be mixed, but attention must be given to the connection options of the modules.

Central Connection



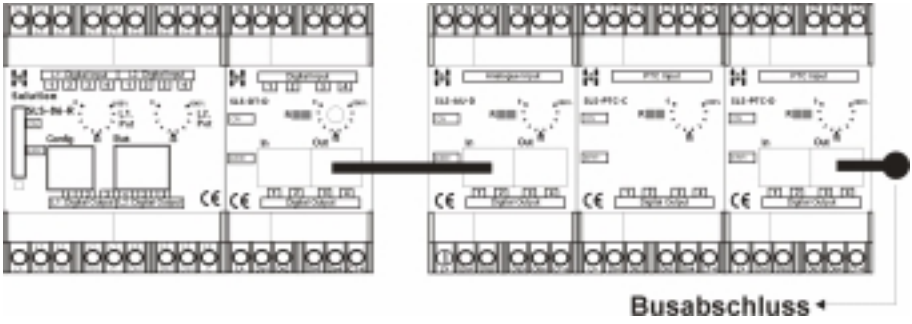
Central modules are placed side by side on DIN rail and connected with recessed back-to-back connectors. It is possible to connect up to 31 extension modules with the SLS-86. This makes up to 250 inputs/outputs. The maximum length of a central connection system, without bus terminator (Busabschluss) is 1 metre.

Decentral Connection



Decentral modules are connected by CAT5 cable and connectors. Connection between SLS-86 and the first extension module is also with the CAT5 cable. The maximum distance between two modules must not be more than 100 metres. The maximum overall distance of all SLS-modules in one system must not exceed 600 metres. A bus terminator must be used on the output port of the last module.

Mixed connection



It is also possible to mix central and de-central modules in one system.

(Example: SLS-86-R; SLS-DT-D; SLS-AU-D; SLS-PTC-C; SLS-PTC-D)

Although decentral modules have CAT5 ports on the front-plate they can also be side connected with recessed back-to-back connectors in the same way as the central modules. Therefore a decentral module can be directly connected with the SLS-86. The connection to an additional decentral module can be made with CAT5 cable. In this case you have the opportunity to connect a central module directly, but you must ensure that the last module is decentral, in order to fit a bus terminator. Also ensure that the distance between the individual modules is not more than 100 metres, that the overall length of the system does not exceed 600 metres and that the last module in the system has a bus terminator fitted. In addition ensure that the total system is connected in a series configuration.

Base module (SLS-86)

- 8 digital inputs
- 6 digital outputs
- 2 external potentiometers

Description

Although the Base module is the central controller in a SLS system it can also be run separately, stand-alone using just its 8 inputs and 6 outputs..

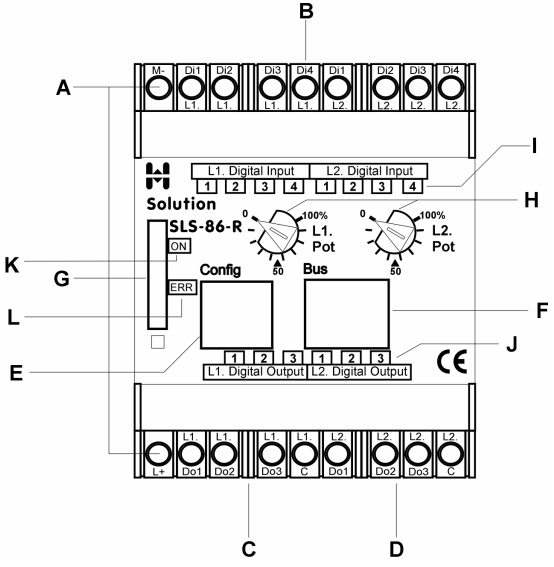


Fig: Front view of the module

A Supply voltage L+: +24Vdc M-: Ground

B 8 digital inputs L1.Di1(**L**ocal **1.D**igital **i**nput **1**)to L1.Di4 and L2.Di1 to L2.Di4 (4 inputs are dual digital/analogue)

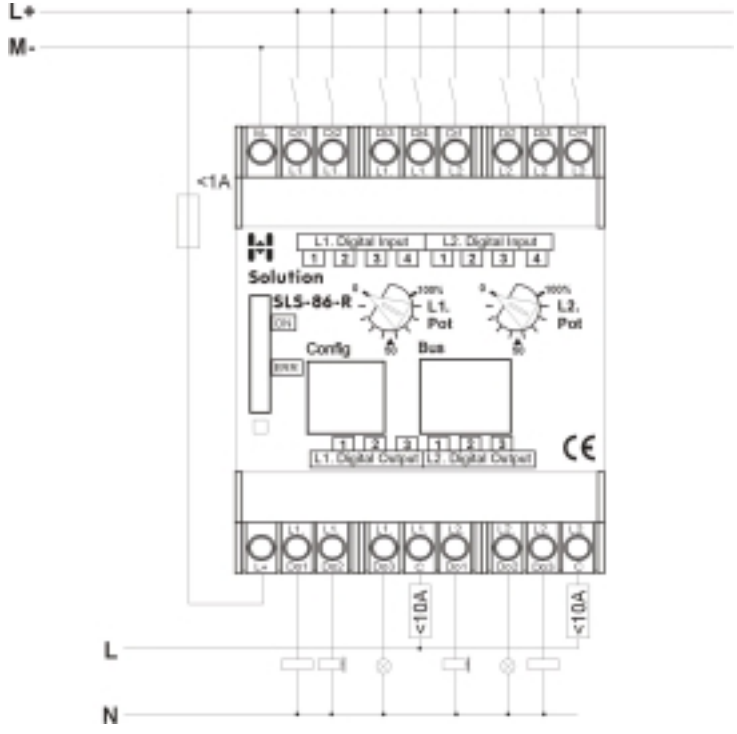
C 3 digital outputs L1.Do1 to L1.Do3(**L**ocal **1.D**igital **o**utput **3** terminal L1.C is the common connection for the digital outputs L1.Do1 to L1.Do3

D 3 digital outputs L2.Do1 to L2.Do3
terminal L2.C is the common connection for the digital outputs L2.Do1 to L2.Do3

E Modular socket to connect programming cable (SLS-86-CONN)

F CAT5 socket for bus connection
G Slot to insert memory card (SLS-86-SIM)
H 2 potentiometers for timer adjustment
I LED-display for digital input status
J LED-display for digital output status
K LED-display: supply voltage is OK
L LED-display: module failure or program failure

Example



Type selection

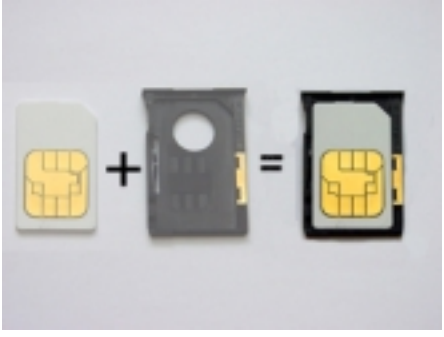
SLS-86-	.	Main module
	R	Relay output
	S	Solid State output

Technical information (SLS-86)

Supply voltage	24VDC +/- 10%
Power consumption	10W
Operating temperature	-15°C to +55°C 50% to 90% rH non condensing
Storage temperature	-25°C to +70°C non condensing
Inputs L1.Di1 to L1.Di4 L2.Di1 to L2.Di4	Input resistance: 44kΩ
Outputs L1.Do1 to L1.Do3 L2.Do1 to L2.Do3	
Relay output	230VAC max. 5A
Ue/Ie AC-15	120V/1,5A 240V/1A
Ue/Ie DC-13	24V/1A
Life	$1x10^7$ mechanical, $1x10^5$ electrical
Solid State output	
Ue DC-13 Photomos	60VDC/2A
Data memory without power supply	
Non-volatile markers and counters	min. 30 days
Time/Date	min. 30 days
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

Memory card (SLS-86-SIM)

Description



SLS uses a memory card which is visually identical to the SIM card of a mobile phone (don't mix up). Insert the card front side into the SLS-86.

Type selection

SLS-86-SIM	SIM - memory card 8kB

Programming cable (SLS-86-CONN)

Description

Programming SLS-86 takes place on the PC. SLS-86-CONN is required to transmit the program or to test the status. Connect the cable to the PC using the RS232 (COM) port and to the SLS-86 with the RJ45 connection.

Type selection

SLS-86-CONN	Programming cable PC/SLS-86 2,5m length

Digital – extension module (SLS-D)

- 4 digital inputs
- 4 digital outputs
- 1 external potentiometer

Description

The digital extension module complements the available inputs/outputs of SLS-86. Up to 31 digital extension modules can be connected with SLS-86.

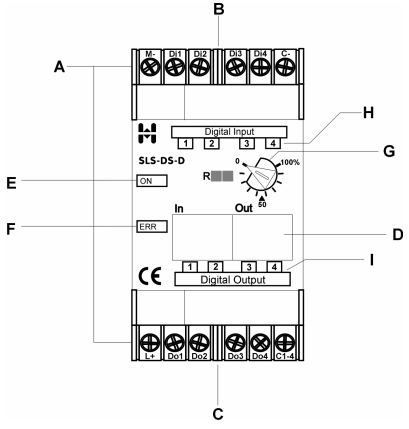
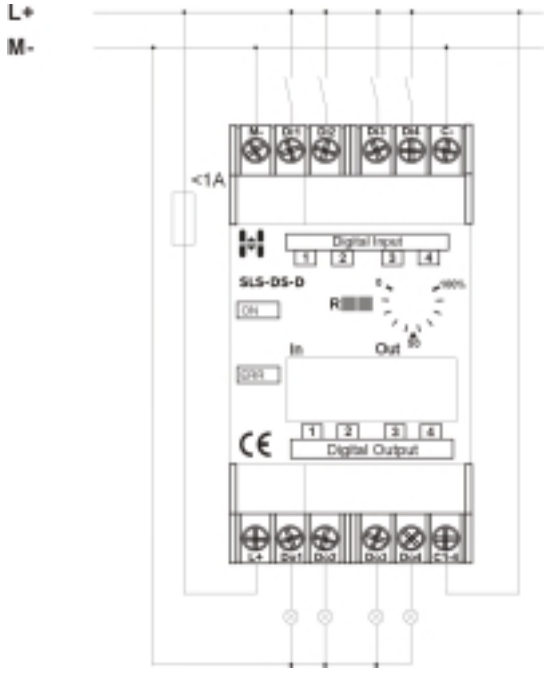


Fig: Front view of the digital extension module

A Supply voltage L+: +24Vdc M-: Ground
B 4 digital inputs Di1 to Di4; C- is the common ground
C 4 digital outputs Do1 to Do4
Terminal C1-4 is the common connection for the digital outputs Do1 to Do4
D CAT5 socket to connect decentral(D) modules to the bus. Central(C) modules are connected by recessed back-to-back connectors.
E LED-display: Supply voltage is OK
F LED-display: module failure or program failure
G Potentiometer for time adjustment
H LED-display for digital input status
I LED-display for digital output status

Example



Type selection

SLS-D	.	-	.	Digital extension module
	R			Relay output
	T			Transistor output (PNP)
	S			Solid State output
			C	central extension module
			D	decentral extension module

Technical information (SLS-D)

Supply voltage	24VDC +/-10%
Power consumption	3W
Operating temperature	-15°C to + 55°C 50% to 90% rH non condensing
Storage temperature	-25°C to +70°C non condensing
Inputs Di1 to Di4	
Input resistance	min. 3kOhm
Outputs Do1 to Do4	
Relay output	230VAC max. 5A
Ue/Ie AC-15	120V/1,5A 240V/1A
Ue/Ie DC-13	24V/1A
Life	$1x10^7$ mechanical, $1x10^5$ electrical
Transistor output	(PNP) 24VDC/800mA short circuit proof
Solid State output	
Ue DC-13 Photomos	60VDC/2A
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

PTC – extension module (SLS-PTC)

- ☞ 4 analogue inputs (PTC)
- ☞ 4 digital outputs
- ☞ 1 external potentiometer

Description

With the PTC extension module you are able to record and analyse 4 PTC loops, each with up to 6 PTC´s in series according to DIN44081. You can connect up to 31 PTC – extension modules with the SLS-86.

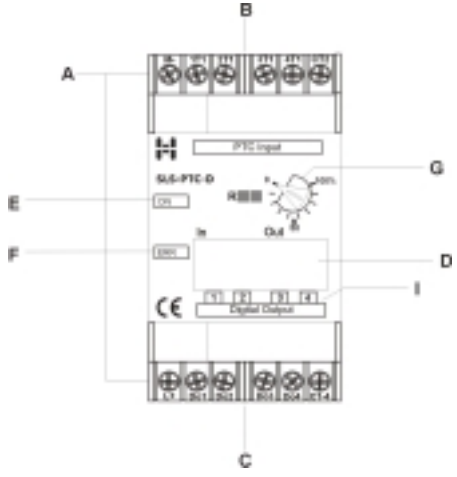
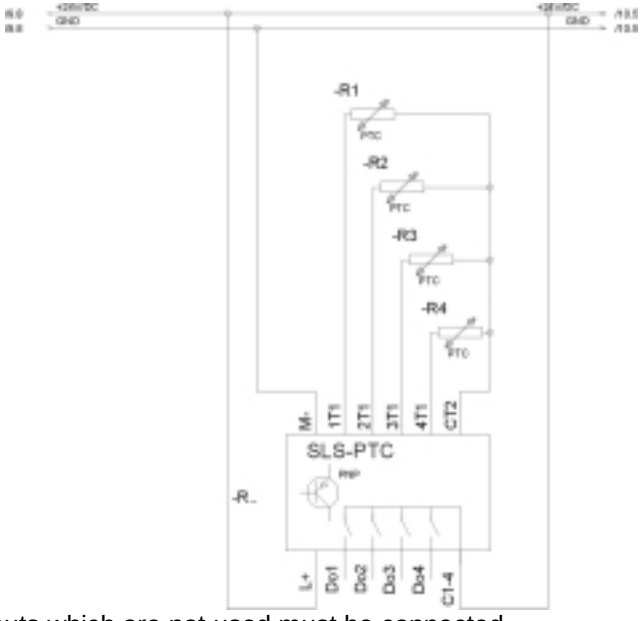


Fig: Front view of the PTC - module

A	Supply voltage L+: +24Vdc M-: Ground
B	4 PTC - inputs 1T1, 2T1; 3T1, 4T1; CT2 is the common connection for the PTC sensors
C	4 digital outputs Do1 to Do4. Terminal C1-4 is the common connection for the digital outputs Do1 to Do4
D	CAT5 socket to connect decentral(D) modules with the bus. Central(C) modules are connected by recessed back-to-back connectors.
E	LED-display: supply voltage OK
F	LED-display: module failure or program failure
G	Potentiometer for time adjustment
I	LED-display for digital output status

Example



PTC inputs which are not used must be connected.

Type selection

SLS-PTC-	.	PTC extension module
	C	central extension module
	D	decentral extension module

Technical information (SLS-PTC)

Supply voltage	24VDC +/-10%
Power consumption	3W
Operating temperature	-15°C to +55°C 50% to 90% rH non condensing
Storage temperature	-25°C to +70°C non condensing
Inputs 1T1 to 1T4	
Sensor	PTC Sensor DIN44081
max. Overall resistor	1500Ohm (6 Sensors)
Triggering threshold	3100Ohm +/-10%
Reset threshold	1650Ohm +/-10%
Short-circuit detection	0 – 20Ohm
Outputs	
Transistor output (PNP)	24VDC/800mA short circuit proof
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

PT100 – extension module (SLS-PT100)

- 2 analogue inputs (PT100)
- 4 digital outputs
- 1 external potentiometer

Description

With the PT100 extension module you are able to connect up to 2 PT100 sensors of 2-, 3- or 4 wire types. Up to 31 PT100 extension modules can be connected with the SLS-86.

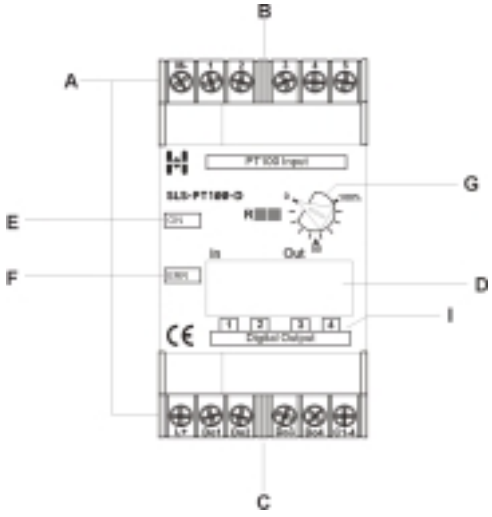
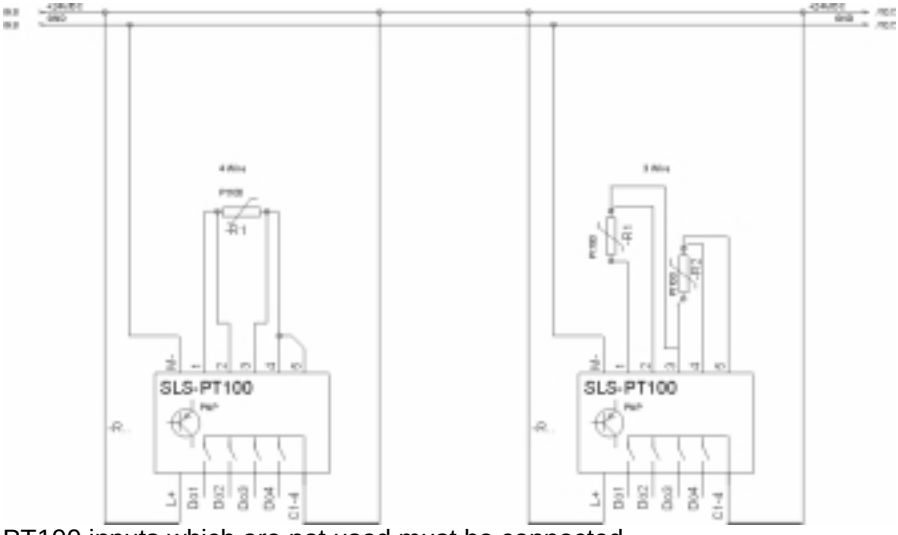


Fig: Front view of the PT100 module

A	Supply voltage L+: +24Vdc M-: Ground
B	5 inputs 1 to 5 for 2 PT100
C	4 digital outputs Do1 to Do4 terminal C1-4 is the common connection for the digital outputs Do1 to Do4
D	CAT5 socket to connect decentral(D) modules with the bus. Central(C) modules are connected by recessed back-to-back connectors
E	LED-display: supply voltage OK
F	LED-display: module failure or program failure
G	Potentiometer for time adjustment
I	LED-display for digital output status

Example



PT100 inputs which are not used must be connected.

Type selection

SLS-PT100-	.	PT100 extension module
	C	central extension module
	D	decentral extension module

Technical information (SLS-PT100)

Supply voltage	24VDC +/-10%
Power consumption	3W
Operating temperature	-15°C to +55°C 50% to 90% rH non condensing
Storage temperature	-25°C to +70°C non condensing
PT100 – Inputs	
Number	2
Measuring range	-50°C to +300°C
Accuracy	+/-0,1°C
Outputs Do1 to Do4	
Transistor output (PNP)	24VDC max. 800mA short circuit proof
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

PT1000 – extension module (SLS-PT1000)

- 4 analogue inputs (PT1000)
- 4 digital outputs
- 1 external potentiometer

Description

With the PT1000 extension module you are able to connect up to 4 PT1000 sensors of 2 wire format. Up to 31 PT1000-extension modules can be connected with the SLS-86.

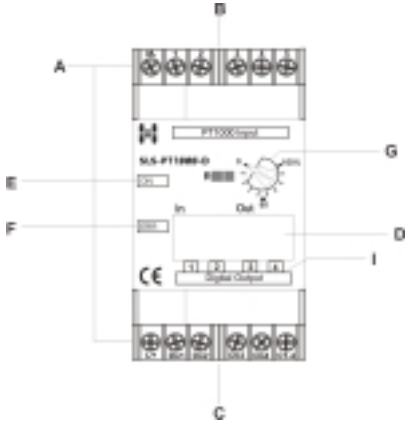
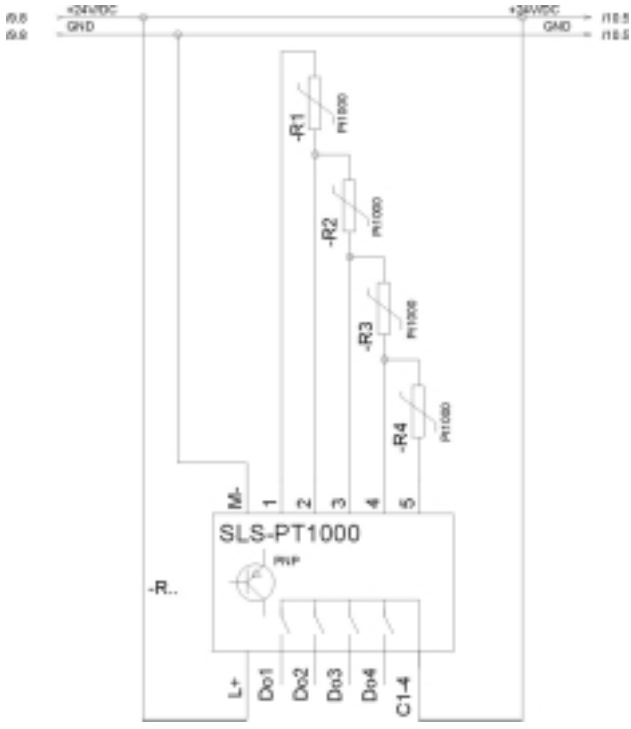


Fig: Front view of the PT1000 module

A	Supply voltage L+: +24Vdc M-: Ground
B	5 inputs, 1 to 5, for up to 4 x PT1000
C	4 digital outputs Do1 to Do4 Terminal C1-4 is the common connection for the digital outputs Do1 to Do4
D	CAT5 socket for the connection of decentral(D) modules with the bus. Central(C) modules are connected with recessed back-to-back connectors
E	LED-display: supply voltage OK
F	LED-display: module failure or program failure
G	Potentiometer for time adjustment
I	LED-display for digital output status

Example (SLS-PT1000)



PT1000 inputs which are not used must be connected.

Type selection

SLS-PT1000-	.	PT1000 extension module
	C	central extension module
	D	decentral extension module

Technical information (SLS-PT1000)

Supply voltage	24VDC +/-10%
Power consumption	3W
Operating temperature	-15°C to +55°C 50% to 90% rH non condensing
Storage temperature	-25°C to +70°C non condensing
PT1000 – inputs	
Number	4
Measuring range	-50°C to +300°C
Accuracy	+/-0,1°C
Outputs Do1 to Do4	
Transistor output (PNP)	24VDC max. 800mA short circuit proof
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

Current input – extension module (SLS-AI)

- 4 analogue inputs (current signal)
- 4 digital outputs
- 1 analogue output (voltage signal)
- 1 external potentiometer

Description

With the current input extension module you are able to connect and analyse up to 4 current sources of 0 to 20mA or 4 to 20mA. Up to 31 current input extension modules can be connected with the SLS-86.

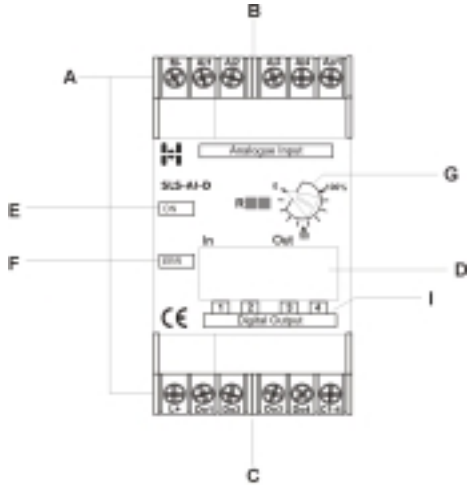


Fig: Front view of the AI module

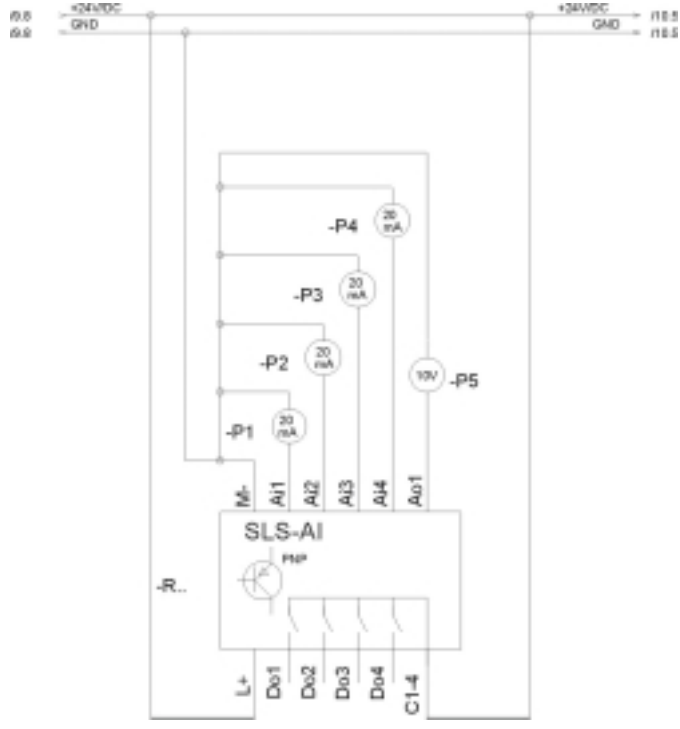
A Supply voltage L+: +24Vdc M-: Ground

B 4 current inputs Ai1 to Ai4; Ao1 is the voltage output from 0 to 10VDC

C 4 digital outputs Do1 to Do4
Terminal C1-4 is the common connection for the digital outputs Do1 to Do4

D CAT5 socket for the connection of decentral(D) modules with the bus. Central(C) modules are connected with recessed back-to-back connectors
E LED-display: supply voltage is OK
F LED-display: module failure or program failure
G Potentiometer for time adjustment
I LED-display for digital output status

Example



Type selection

SLS-AI-	.	Current input extension module
	C	central extension module
	D	decentral extension module

Technical information (SLS-AI)

Supply voltage	24VDC +/-10%
Power consumption	3W
Operating temperature	-15°C to +55°C 50% to 90% rH non condensing
Storage temperature	-25°C to +70°C non condensing
Inputs Ai1 to Ai4	
Input resistance	250Ohm
Resolution	10 Bit
Repeat accuracy	+/- 0,1%
Precision	+/- 0,5%
Output	
Output Ao1	0 to 10VDC
Current output	≤ 2mA
Repeat accuracy	+/-0,1%
Precision	+/-0,5%
Outputs Do1 to Do4	
Transistor output (PNP)	24VDC max. 800mA short circuit proof
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

Voltage input – extension module (SLS-AU)

- 4 analogue inputs (voltage signal)
- 4 digital outputs
- 1 analogue output (voltage signal)
- 1 external potentiometer

Description

With the voltage input extension module you are able to connect and analyse up to 4 voltage sources of 0 to 10V. Up to 31 voltage input – extension modules can be connected with SLS-86.

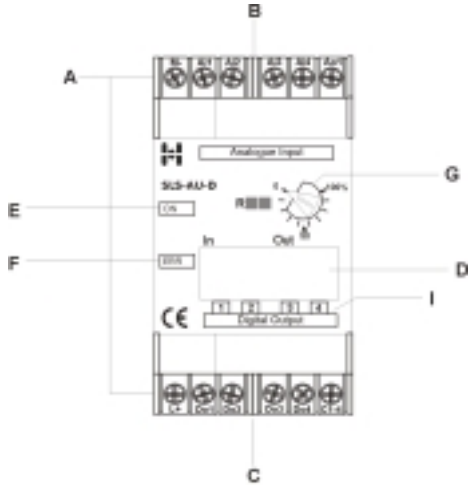


Fig: Front view of the AU - module

A Supply voltage L+: +24Vdc M-: Ground

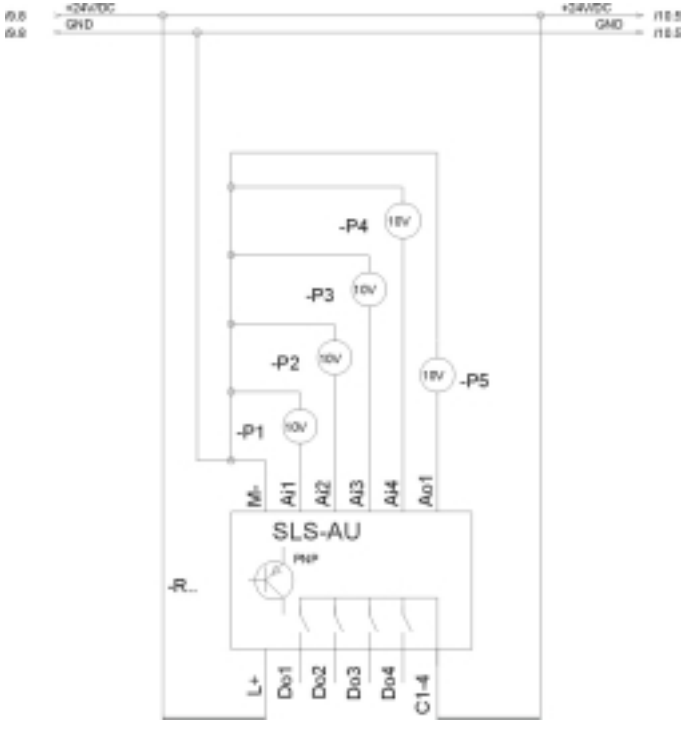
B 4 voltage inputs Ai1 to Ai4; Ao1 is the voltage output from 0 to 10VDC

C 4 digital outputs Do1 to Do4
Terminal C1-4 is the common connection for the digital outputs Do1 to Do4

D CAT5 socket for the connection of decentral(D) modules with the bus. Central(C) modules are connected with recessed back-to-back connectors.

E LED-display: supply voltage OK
F LED-display: module failure or program failure
G Potentiometer for time adjustment
I LED-display for digital output status

Example



Type selection

SLS-AU-	.	voltage input – extension module
	C	central extension module
	D	decentral extension module

Technical information (SLS-AU)

Supply voltage	24VDC +/-10%
Power consumption	3W
Operating temperature	-15°C to +55°C 50% to 90% rH not condensing
Storage temperature	-25°C to +70°C not condensing
Inputs Ai1 to Ai4	
Input resistance	54 kOhm
Resolution	10 Bit
Repeat accuracy	+/-0,1%
Precision	+/-0,5%
Output	
Output Ao1	0 to 10VDC output
Current output	≤ 2mA
Repeat accuracy	+/-0,1%
Precision	+/-0,5%
Output Do1 to Do4	
Transistor output (PNP)	24VDC max. 800mA short circuit proof
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

FBR – Extension module (SLS-FBR)

- ☞ 4 FBR – inputs (two-wire room thermostats)
- ☞ 4 digital outputs
- ☞ 1 external potentiometer

Description

With the FBR extension module you can connect up to 4 FBR controllers. Up to 31 current extension modules can be connected with the SLS-86.

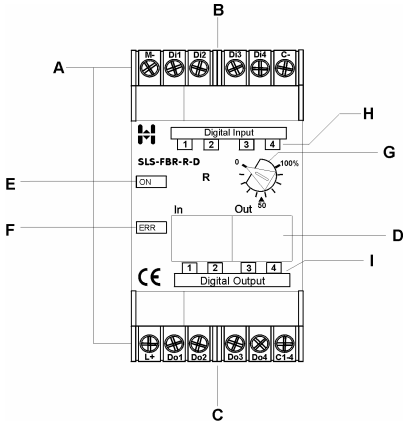
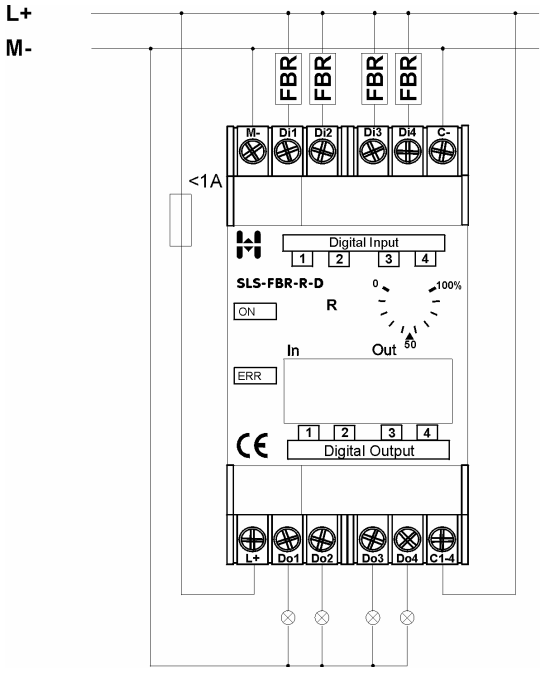


Fig: Front view of the FBR module

A Supply voltage L+: +24Vdc M-: Ground
B 4 FBR inputs Di1 to Di4; C- is the common ground
C 4 digital outputs Do1 to Do4
Terminal C1-4 is the common connection for the digital outputs Do1 to Do4
D CAT5 socket for the connection of decentral(D) modules with the Bus. Central(C) modules are connected with recessed back-to-back connectors.
E LED-display: supply voltage OK
F LED-display: module failure or program failure
G Potentiometer for time adjustment
H LED-display for FBR input status
I LED-display for digital output status

Example



Type selection

SLS-FBR-	.	- .	FBR extension module
	R		Relay output
		C	Central extension module
		D	Decentral extension module

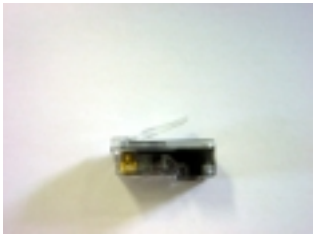
Technical information (SLS-FBR)

Supply voltage	24VDC +/-10%
Power consumption	0,5W
Operating temperature	-15°C to + 55°C 50% to 90% rH not condensing
Storage temperature	-25°C to 70°C not condensing
Inputs Di1 to Di4	
Input resistance	min. 3kOhm
Outputs Do1 to Do4	
Relay output	230VAC max. 5A
Ue/Ie AC-15	120V/1,5A 240V/1A
Ue/Ie DC-13	24V/1A
Life	$1x10^7$ mechanical, $1x10^5$ electrical
Terminals	
Wiring	max. 2 x 1,5mm²
Screw-type	Pozidrive 1
Tightening torque	1,0Nm

Bus terminator (SLS-86-BUS)

Description

The bus terminator has to be installed on the last module in a decentral or partly decentral application.



Type selection

SLS-86-BUS	bus terminator (RJ45 8/8)

Installation

This chapter deals with the dimensions and the correct mounting of the SLS-86 and its extension modules.

Module size SLS-86

The SLS-86 module is 67,5mm wide, 85mm high and 70mm deep and suitable for mounting on a 35mm rail according to DIN/EN 50022.

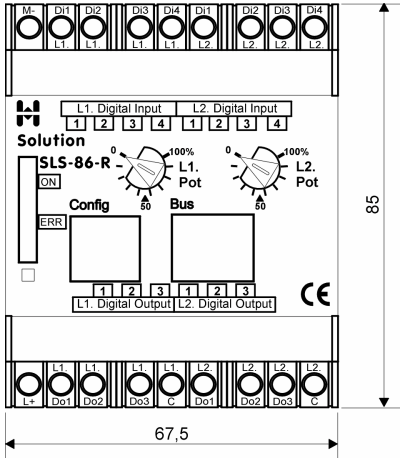


Fig: Front view of the SLS-86 with dimensions

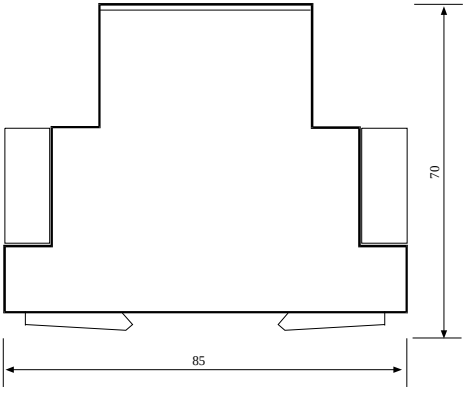


Fig: Side view of the SLS-86

Module size SLS - extension modules

The SLS – extension modules are 45mm wide, 85mm high, 70mm deep and suitable for mounting on a 35mm rail according to DIN/EN 50022.

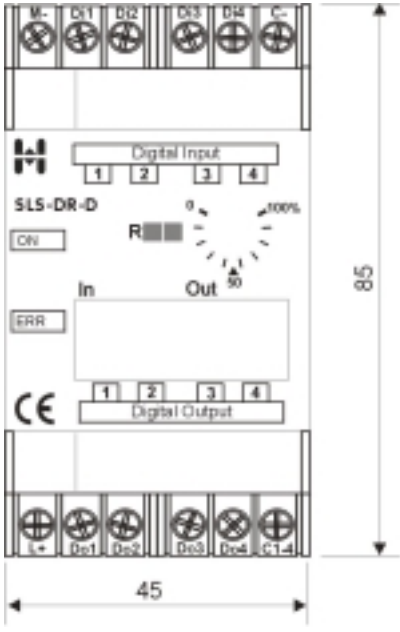


Fig: Front view of the SLS module with dimensions

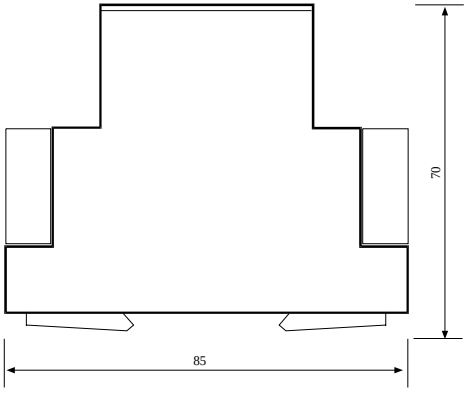


Fig: Side view of the SLS – extension module

DIN rail mounting

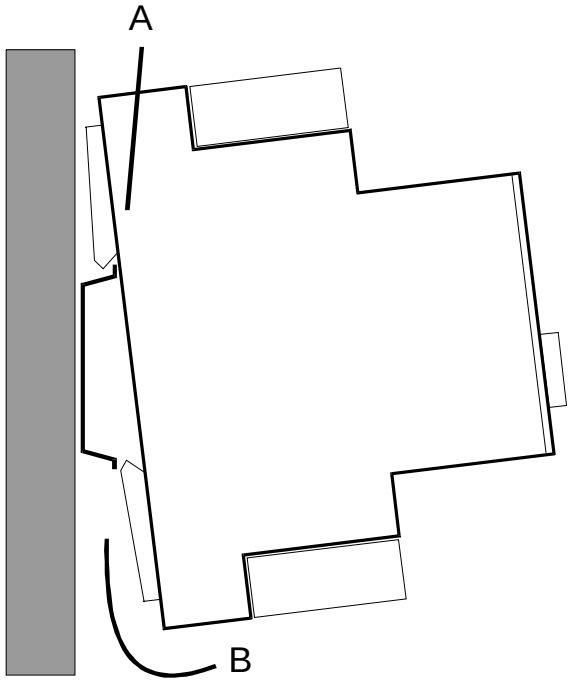


Fig: mounting of the SLS-86 and the SLS-module on the 35mm-rail.

When mounting the SLS-86 on DIN-rail attach the module on the top first (A) and then fix it by levering open the spring clip with a screw driver and easing back onto the rail (B).

Advice:
Please use a suitable Pozidrive screwdriver for connecting the terminals and fasten the terminals with max. 1.0 Nm tightening torque.
Type of screw: Pozidrive No 1.

Software installation

This chapter will guide you through the installation of SoftwirePLUS.

P.C. – System requirements

The following is the recommended specification to provide a proper installation of the programming software:

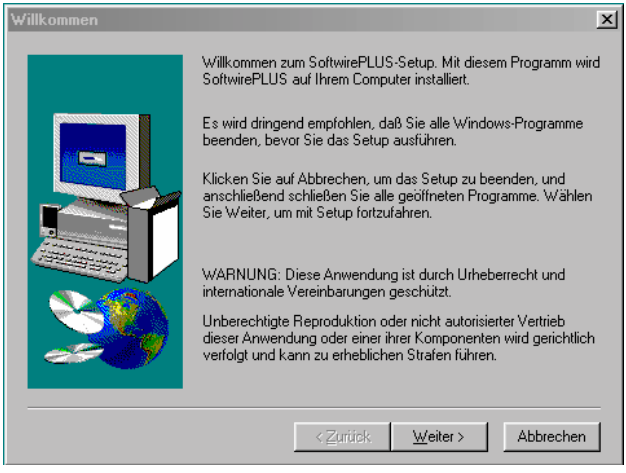
	Minimum:	Recommended:
Processor:	Pentium 90	Pentium 166
Operating system:	32-bit MS Win95/98 or Win NT Version 3.51/Win2000 or higher	
RAM:	16 MB (32 MB for Win NT)	64 MB (128 MB for Win NT)
Free memory:	20 MB	40 MB
Serial port:	1 free RS232 port	1 free RS232 port

Installation

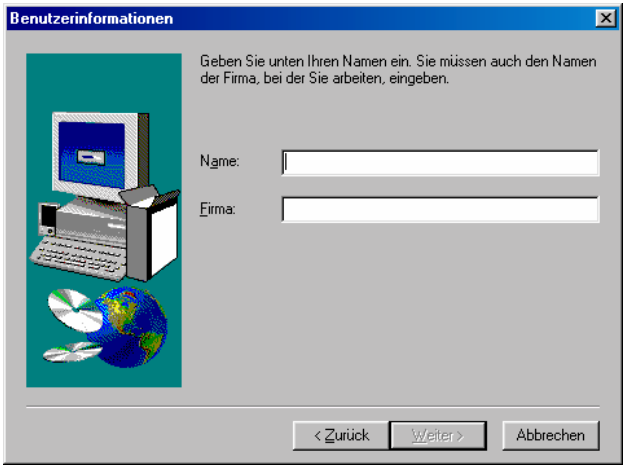
- ❑ Start Windows, if its necessary.
- ❑ Shut down all other Windows applications, to avoid conflicts.
- ❑ Insert the SoftwirePLUS-CD into your CD-ROM drive. The installation program will start automatically.

- ❑ If nothing happens for a while, choose „Run“ from the Windows start menu. Select D:\setup.exe (or other drive letter indicating the CD-ROM drive in your system).

If you have no other applications running on your system, you can click „Weiter“. By clicking the button „Abbrechen“ you can cancel the installation.


Willkommen
Willkommen zum SoftwirePLUS-Setup. Mit diesem Programm wird SoftwirePLUS auf Ihrem Computer installiert.
Es wird dringend empfohlen, daß Sie alle Windows-Programme beenden, bevor Sie das Setup ausführen.
Klicken Sie auf Abbrechen, um das Setup zu beenden, und anschließend schließen Sie alle geöffneten Programme. Wählen Sie Weiter, um mit Setup fortzufahren.
WARNUNG: Diese Anwendung ist durch Urheberrecht und internationale Vereinbarungen geschützt.
Unberechtigte Reproduktion oder nicht autorisierter Vertrieb dieser Anwendung oder einer ihrer Komponenten wird gerichtlich verfolgt und kann zu erheblichen Strafen führen.
< Zurück
Weiter >
Abbrechen

Please type in your name and the company name.

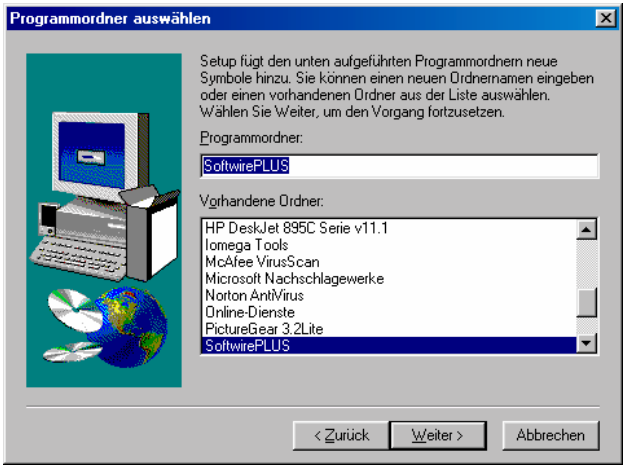

Benutzerinformationen
Geben Sie unten Ihren Namen ein. Sie müssen auch den Namen der Firma, bei der Sie arbeiten, eingeben.
Name:
Firma:
< Zurück
Weiter >
Abbrechen

Please choose your desired directory.

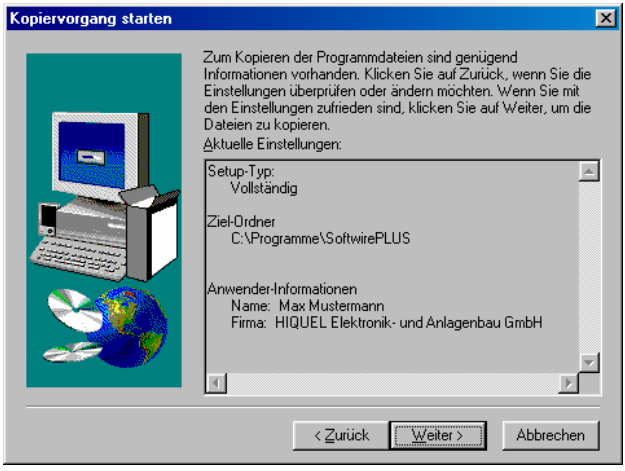
Zielpfad wählen
SoftwirePLUS wird in diesem Verzeichnis installiert.
Klicken Sie Weiter zur Installation in diesem Verzeichnis.
Durchsuchen zur Installation in einem anderen und wählen Sie dieses.
Klicken Sie Abbrechen, um Setup zu beenden, wenn Sie SoftwirePLUS nicht installieren.
Zielverzeichnis
C:\Programme\SoftwirePLUS
Durchsuchen...
< Zurück
Weiter >
Abbrechen

By clicking „Weiter“ you can confirm the standard directory. In order to choose another directory please click on „Durchsuchen“.

Please choose the program directory in your start menu.



The installation details will be summarised here.


Kopiervorgang starten
Zum Kopieren der Programmdateien sind genügend Informationen vorhanden. Klicken Sie auf Zurück, wenn Sie die Einstellungen überprüfen oder ändern möchten. Wenn Sie mit den Einstellungen zufrieden sind, klicken Sie auf Weiter, um die Dateien zu kopieren.
Aktuelle Einstellungen:
Setup-Typ:
Vollständig
Ziel-Ordner
C:\Programme\SoftwirePLUS
Anwender-Informationen
Name: Max Mustermann
Firma: HIQUEL Elektronik- und Anlagenbau GmbH
< Zurück
Weiter >
Abbrechen

Click „Weiter“ to start the installation process. This will take a few minutes.

Setup abgeschlossen
Setup hat das Kopieren der Dateien auf Ihren Computer abgeschlossen.
Setup wird das Programm jetzt starten. Wählen Sie weiter unten eine Option.
Ich möchte das Programm jetzt starten.
Klicken Sie auf Beenden, um das Setup abzuschließen.
< Zurück
Beenden

After installation you can exit the set-up by clicking „Beenden“. Start SoftwirePLUS in the start menu. „Start“ – „Program“ – „SoftwirePLUS“.

SoftwirePLUS
the program

General

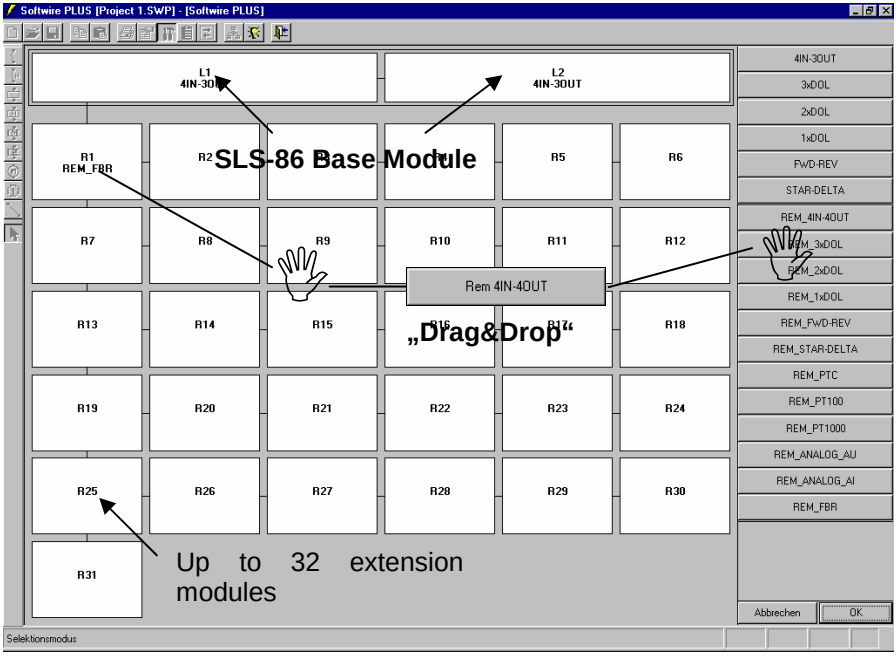
With SoftwirePLUS you can create applications using all the advantages of the WINDOWS operating system. The control elements within SoftwirePLUS utilise IEC standard symbols that you are already familiar with and can therefore easily recognise. As a result the learning effort is reduced to a minimum.
Please note that SoftwirePLUS executes the circuit from left to the right. This means that the software starts by reading the status of the control element of the top left of the PC screen.

Hardware configuration screen

After starting SoftwirePLUS you will initially see the hardware configuration menu in which the function of all the modules in a system is defined.
The L1 and L2 modules at the top of the screen represent the SLS-86 base module, divided into two halves (local modules). The default condition of both of these modules is 4 Digital inputs and 3 Digital outputs (4IN-3OUT). These functions can be removed and replaced with any of the function macros listed to the right of the screen ***NOT*** starting with Rem (remote).
The R1 to R31 modules represent the 31 extension (remote) modules that can be attached to an SLS-86 base module. The function macros listed on the right hand side of the screen starting with REM can be loaded into each of the R modules.

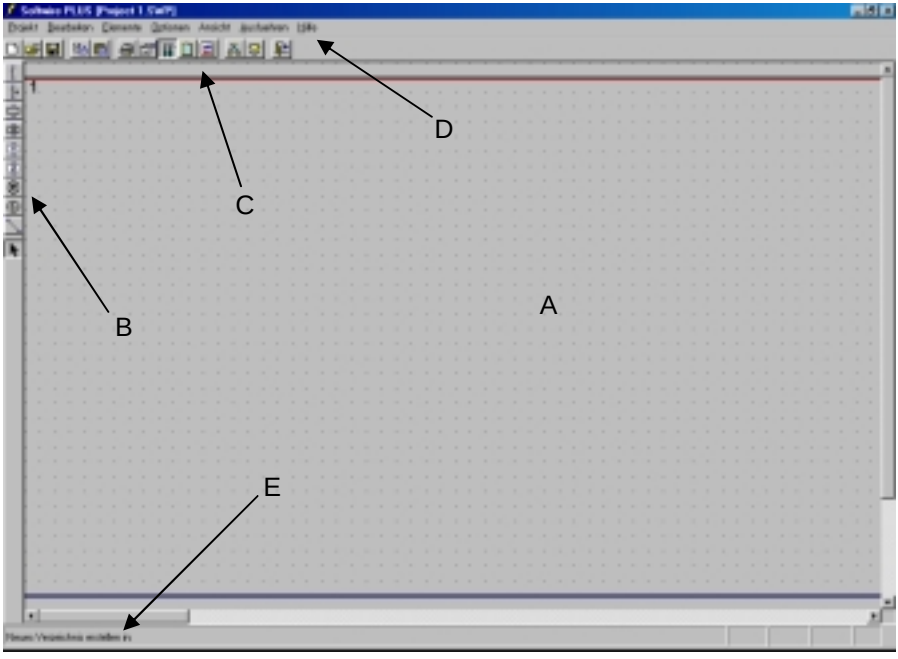
To load a function macro into the L1 or L2 modules first 'right click' and delete the 4IN-3OUT default. Then click on and ‚drag'and'drop' one of the macros to the L module. The Rem macro's are loaded into the R modules in the same way, but as the R modules are initially un-allocated there is no existing macro to be deleted.

Once the hardware configuration has been completed click on OK



Work space

Clicking on OK in the hardware configuration screen takes you to the work space where you create your program.



A **Work space:** Here you will create your wiring diagram.

B **Symbol Library:** Here you select the program element symbol to insert into your wiring diagram.

C **Tool bar:** Here you can click on symbols for load project, save project, print project, download, simulation etc.

D **Menu:** All actions can be performed by using the drop down menu as well, if preferred.

E **Status line:** Here you will see information concerning the active mode, selected program element and other information.

Functions

In this chapter all function elements which are necessary to create a application/wiring diagram with SoftwirePLUS are be explained.

Macro functions in the hardware configuration

Macro for 4 in- and 3 outputs

Macro for 3 DOL-starters with 1 free input

Macro for 2 DOL-starters, with 2 free inputs and 1 free output

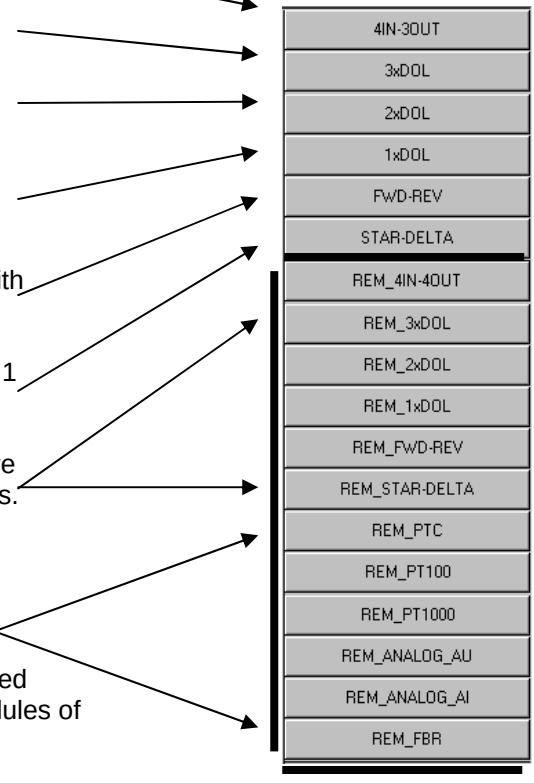
Macro for 1 DOL-starter, with 3 free inputs and 2 free outputs

Macro for FWD/REV-function, with 2 free inputs and 1 free output

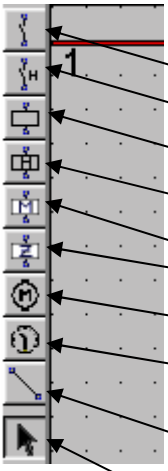
Macro for Star/Delta-starter with 1 Free input

For the remote modules you have to use the „Rem“ function macros.

The RemPTC, RemPT100, RemPT1000, RemANALOG _AU, RemANALOG_AI, And RemFBR macros are required if you use special extension modules of these types.



Program elements



Contact (Normally open, normally closed, etc)

Host-contact (contact of field bus or other control system)

Relays (outputs, timers, bistable function, reset-input)

Host-relay (output to field bus or other control system)

Marker. (normal, rising impulse, falling impulse, etc.)

Counters

Local Starters (SLS-86), Remote starter (SLS)

Real-time-clock – N/O and N/C contacts (switching by days, weeks, months, etc.)

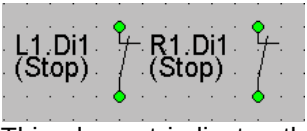
Line tool – draw connection lines between program elements

Cursor tool

Description of the program elements

The following chapter deals with the individual objects.

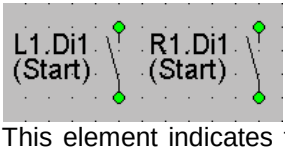
Normally closed contact



This element indicates the inverted status on an input, timer, marker or a normally closed output contact.

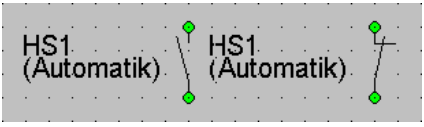
By double clicking an object you will get to the allocation dialogue of the object, to adjust „allocation“ and „description“.

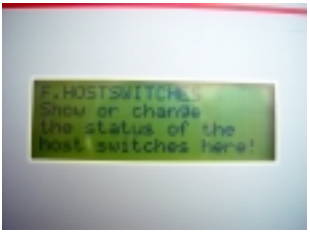
Normally open contact



This element indicates the status of an input, timer, marker or a normally close output contact.

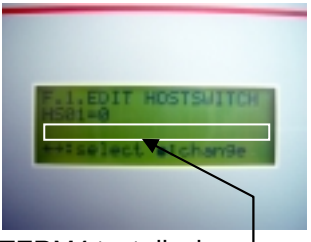
Host-switch





The host switch function generally corresponds to The normally open and normally closed contacts previous described, though the host switch is activated by a host (field) sytem (TERM4 illustrated).

Modbus Host-System: A Modbus converter changes the Modbus-address to the host switch address.

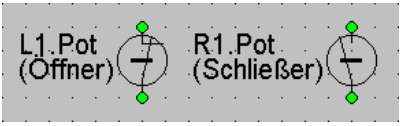


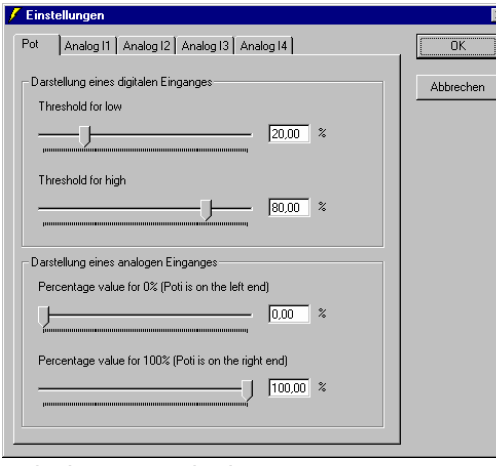
TERM4 Host-System: You can manually activate a host switch by using the TERM4 text display.

This field shows you the „Description“ of the corresponding host switch.

16 host switches are available. See chapter TERM4 for details about operating with the text display.

Potentiometer



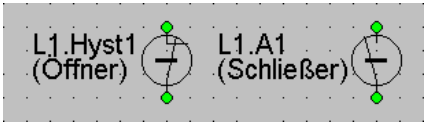


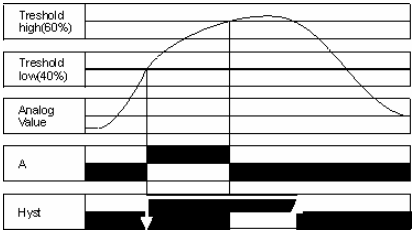
With the potentiometer you can manually adjust time functions (see Timer – On delay).
It is also possible to digitalize a potentiometer and to use it as a digital input. Right-click a module in the hardware configuration screen to get to the allocation dialogue of the corresponding module (see above). the „Pot“ tab shows you two groups with two control bars each.

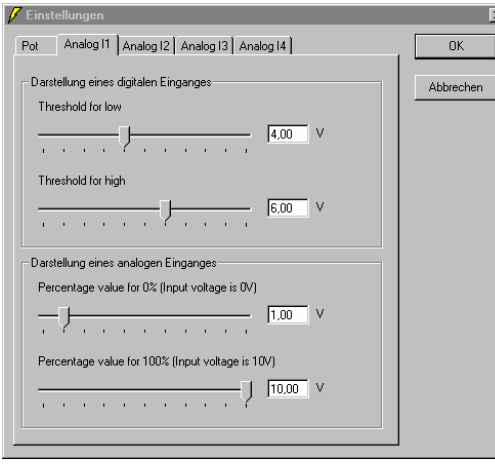
Adjust thresholds for low and high in group „Darstellung eines digitalen Eingangs“. The example shows you a logical activation of the digital potentiometer (HIGH), if the adjusted value exceeds 80%. If the value falls under 20%, the digital potentiometer will be inactive (LOW). A “Hyst”-function develops.

Adjust the threshold value in group „Darstellung eines analogen Einganges“. For example, set the first control in this group at 50% and the minimum potentiometer value will be 50% of the selected value. Configure the maximum potentiometer value with the second control.
Example: Set a timer to 10sec and the potentiometer values at minimum 50% and maximum 100%. As a result the potentiometer range will be adjustable from 5 to 10 seconds.

Digitalize inputs of module L1



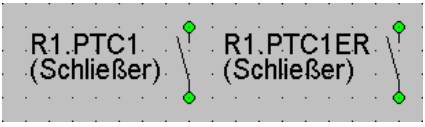


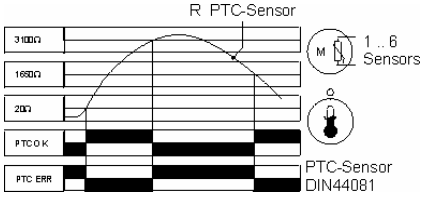


The four inputs of module L1 are Analogue or digital. Analogue signals applied to these inputs and can be digitalized afterwards.

Adjustments of the „Hyst“-objects (for example L1.Hyst1) are the same as the adjustments described for the potentiometer. Actual voltage values replace the percentage representation. Between the two set values the digital input (for example L1.A1) will be active (HIGH), above and below the set values the digital input will inactive (LOW).

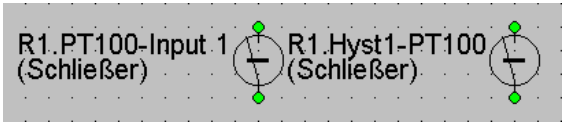
PTC-Objects

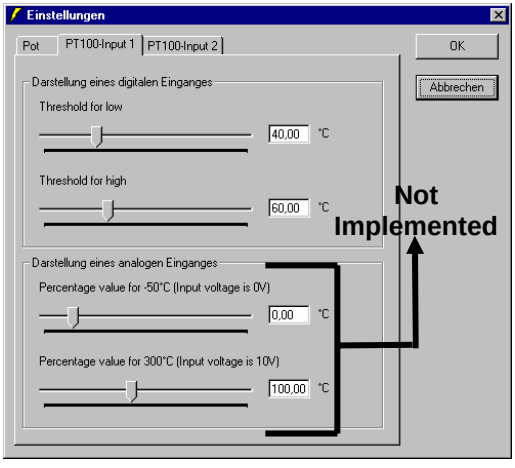




Two objects are available with every input. The “PTC”-object shows you the active state of the sensor and the “ER”-object shows you any failures.
The graph shows you the values with the corresponding function of the objects.
The PTC contact is active if the resistance value of the PTC-sensors is between > 20Ω and < 3100Ω.
The PTC ERROR contact is active if the resistance value is under 20Ω (short circuit monitoring) and if the value is higher than 3100Ω.
Over temperature = Nominal temperature of the PTC sensors, for example exceeding 60°C (=3100Ω).

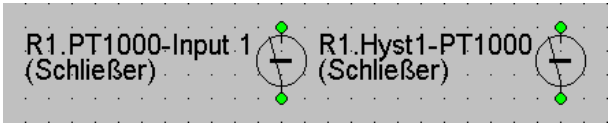
Pt100-Objects





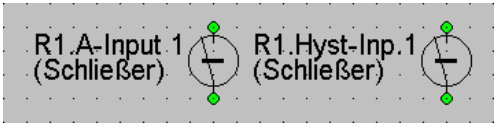
This module offers you „Input“- and „Hyst“-objects. Go to the allocation dialogue in the hardware configuration menu for adjustments. The adjustment of the objects (for example L1.Hyst1) corresponds to the previous described objects (see Potentiometer and Digitalize inputs of module L1), though in this case temperature values replace voltage values or percentages.

Pt1000-Objects

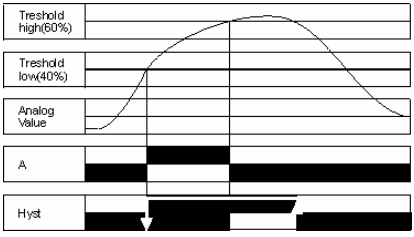


See chapter Pt100-objects for configuration and adjustment. Objects are configured and used identically.

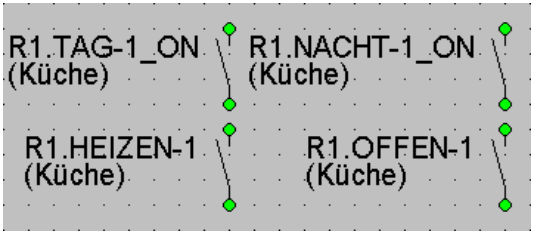
AU- and AI-Objects



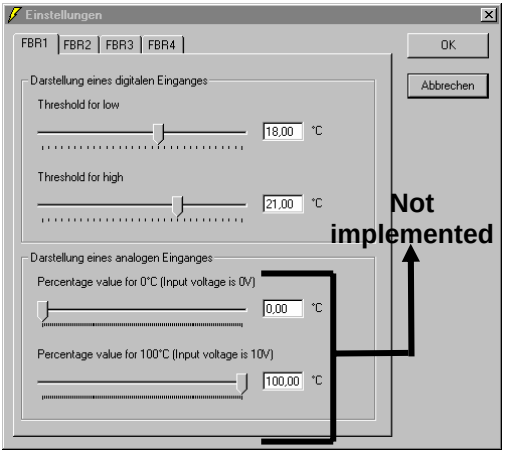
„Input“-objects (active between threshold values) and „Hyst“-objects (active above second threshold – inactive under first threshold) are also available with the analogue modules. Depending on the module type you can adjust voltage or current values using the allocation dialogue.



FBR-Objects (Digital room controller)

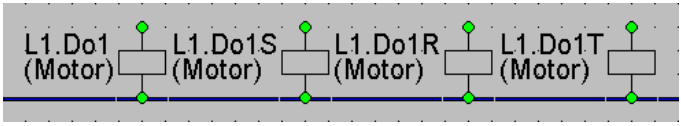


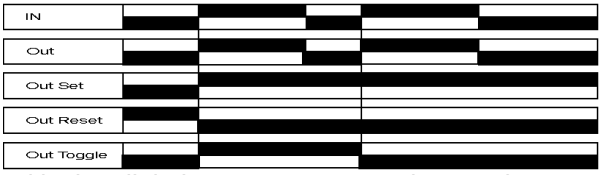
Contact TAG-1_ON (DAY 1_ON) is active if the rotary switch of the FBR-control is in the ☀ position. Numbers 1 to 4 indicate the channel to which the FBR-control is connected.



Contact NACHT-1_ON (NIGHT 1 _ON) is active if the rotary switch of the FBR-control is in the ☾ position.
Contact HEIZEN-1 (HEATING 1)`is active if the temperature at TAG or at NACHT is lower than the set temperature.
Contact OFFEN-1 (OPEN-1) is active if channel 1 receives no FBR-signal. With this function the FBR-control can be installed with a window contact. If the window opens, contact OFFEN-1 will be active and the heating will be switched off. „Threshold for low“ is the rated temperature for night, “Threshold for high” is the rated temperature for day.

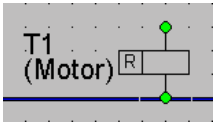
Digital output

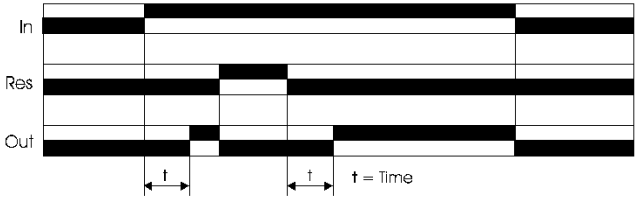




With the digital output you can change the status (ON/OFF) of a digital output. In addition to the normal output function you will find the objects: SET-output, RESET-output and TOGGLE-output.

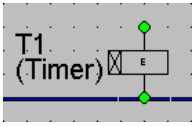
Reset input





With the reset input you can initialise (set to 0) timers, counters or motor starters. The reset input is used like a digital output. Please note that you must insert the element you want to reset into your diagram before inserting a reset input to reset it.

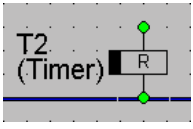
Timer – On delay

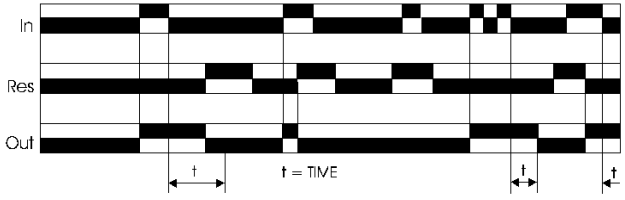


With the On-delay timer you can delay the status of any point of the wiring diagram. This delay can be used as often as required anywhere in the diagram by allocating contacts (normally open or normally closed) to it.

The allocation dialogues of all time delays feature settings to define the time, the duration of the delay and the allocation to an external potentiometer if required. If you allocate the Timer to a potentiometer the adjustment range of the potentiometer is from 0 to the delay time entered.

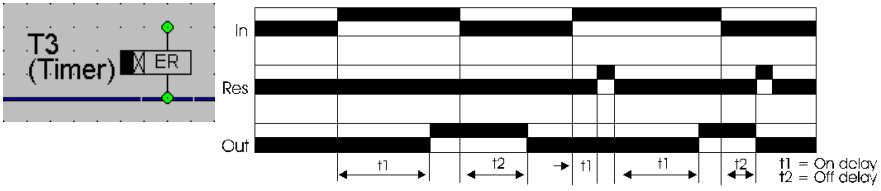
Timer – Off delay





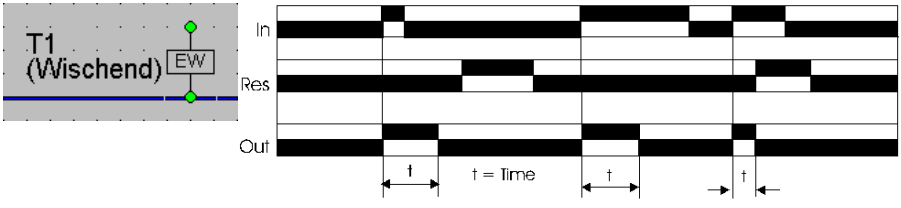
With the Off-delay timer you can hold the status of any point for a specified time.

Timer – On- and Off delay



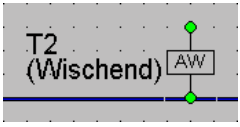
The On and Off delay is a combination of the two previously described functions.

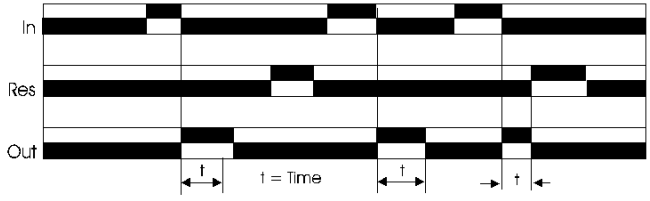
Timer – On pulse



With the On-pulse timer a timed output, corresponding to the pre-set time will be set on the rising impulse (leading edge) of the input.

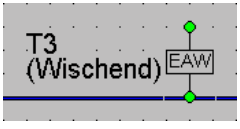
Timer – Off pulse

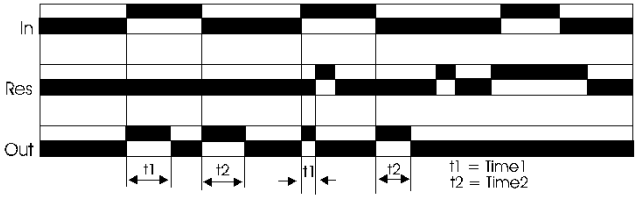




With the off-pulse timer a timed output, corresponding to the pre-set time will be set on the falling impulse (trailing edge) of the input no matter how long the input is set.

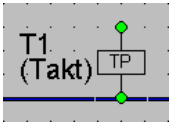
Timer – On- and Off pulse





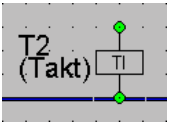
The on and off pulse timer is a combination of the two functions previously described.

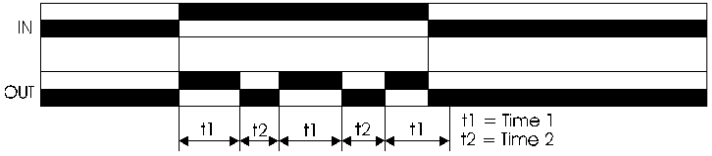
Timer – recycling – pause first



When this input is activated, the output will be set to Low for time t1 and High for time t2. This action will continue until the input is de-activated. After a rising impulse on the input the timer always starts with Low.

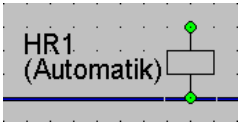
Timer – recycling – impulse first





When this input is activated, the output will be set to High for time t1 and Low for time t2. This action will continue until the input is de-activated. After a rising impulse on the input the timer always starts with High.

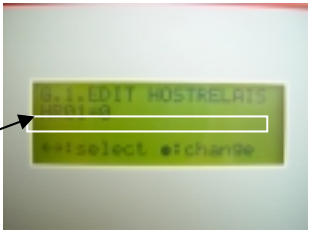
Host-Relay



The host relay logically corresponds to a digital output. But if a host relay is active the “Description” and the status of the corresponding relay will be transmitted to the host system (for example TERM4).

Modbus Host-System: A Modbus converter shifts the Modbus-address to the host switch address.

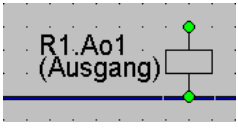
TERM4 Host-System: You can display the status of a host relay on the TERM4 text display. You can also see the „Description“ of the last three messages in the “Show Text List“ menu.



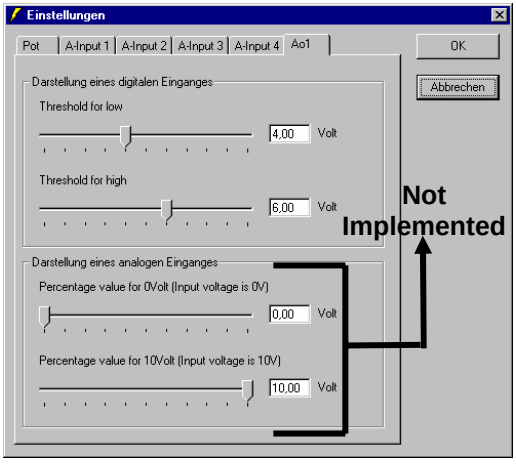
This field displays the “Description” of the corresponding host relay.

There are 16 host switches available. See chapter TERM4 for details about operating with the text display.

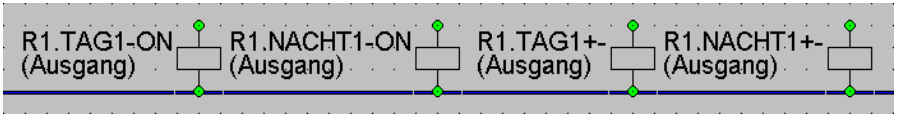
Analogue output for AU- and AI-modules



Analogue modules have a binary (static) analogue output. Configure the output with the allocation dialogue. Corresponding to the binary control, choose two output values (HIGH or LOW) with the slider bars in the group „Darstellung eines digitalen Eingangs“.

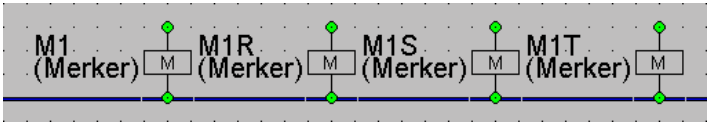


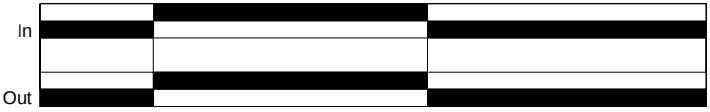
FBR-outputs



Output TAG1-ON (DAY1-ON) activates the control for the monitoring of the day temperature. Numbers 1 to 4 indicate the channel with which the FBR control is connected.
Output NACHT1-ON (NIGHT 1-ON) activates the control for the monitoring of the night temperature. Output TAG1+- (DAY1+/-) activates the function for temperature compensation during day mode. Output NACHT1+- (NIGHT 1 +/-) activates the function for temperature compensation during night mode.

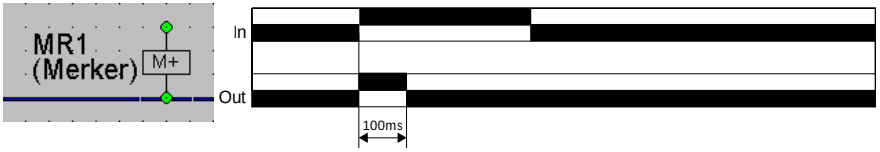
Marker





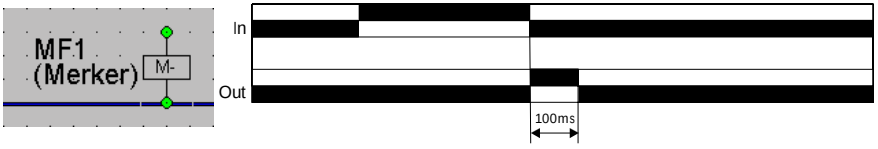
With all marker types, the result of a ‚ladder rung' can be transferred and used in any other ‚ladder rung'. There are 16 markers available.

Impulse marker – rising edge



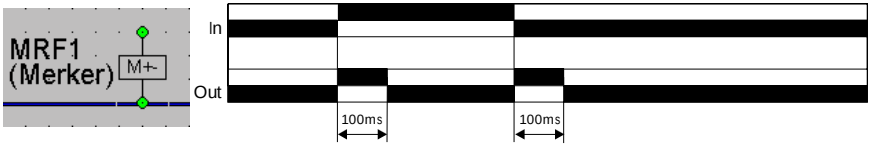
With every rising impulse (leading edge) the marker will energise for 100mS.

Impulse marker – falling edge



With every falling impulse the marker will energise for 100mS.

Impulse marker – rising and falling edge



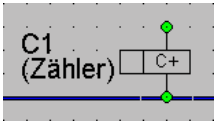
With every rising and falling impulse the marker will energise for 100mS.

There are 16 impulse markers available. The dialogue shows you 100 markers but markers 17 – 100 have no function.

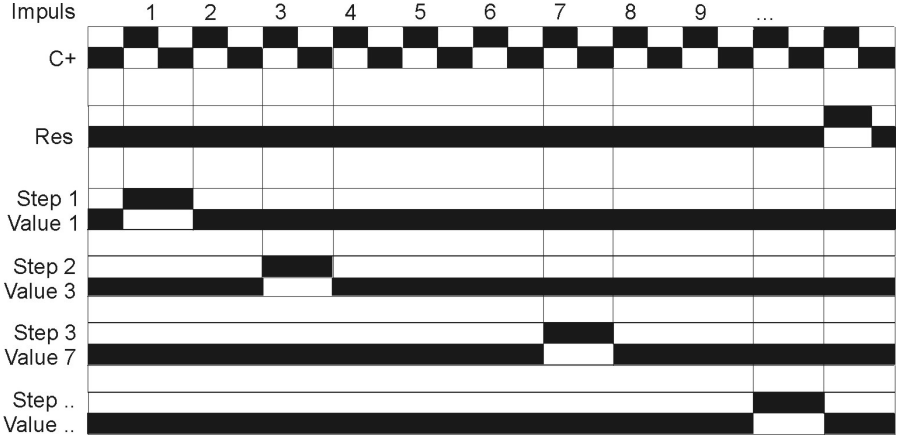
Counters

32 counters are available. Counters Z1 to Z4 are non-volatile, therefore they will retain their count value during a supply failure. Each counter has 8 set points which can be independently allocated to program events.

Counter - Input C+



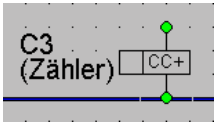
When a rising edge (ON signal) is present on the input, the counter value increases by one. When the counter value reaches a pre-determined value (set point) a program event can be triggered. When the counter value reaches the highest set-point the counter will stop incrementing. A reset input is used to clear the counter value to zero.



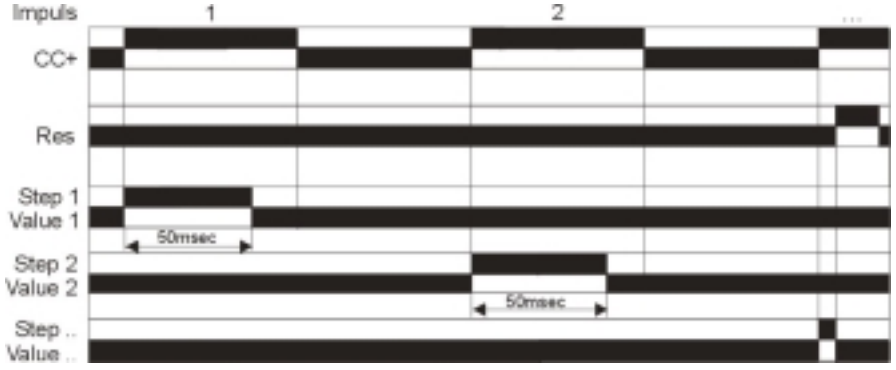
Counter – input C-

When a rising edge is present on the input, the corresponding counter value decreases by one. The counter value stops at zero, it will not continue to a negative value.

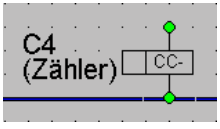
Counter – input CC+



As long as the input is activated, the corresponding counter increments every 100mS, therefore with this function you can measure, for instance how long a contact is closed for.

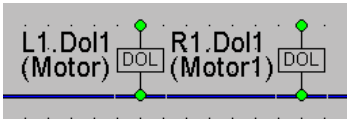


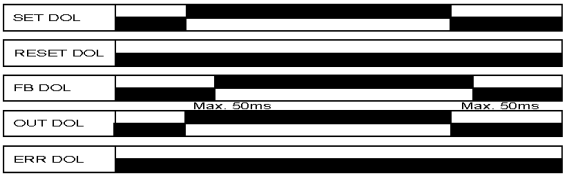
Counter – input CC-

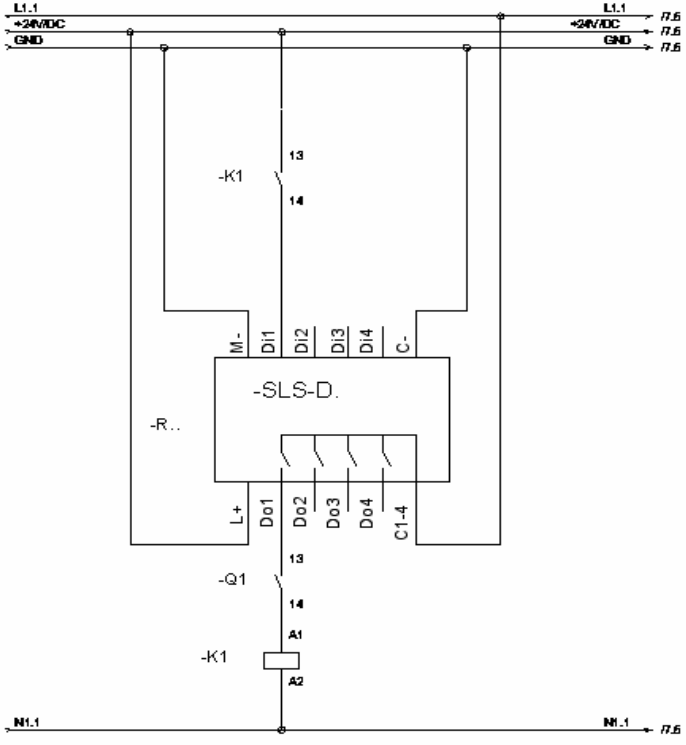


As long as the input is activated, the corresponding counter decrements every 100mS, therefore with this function you can measure, for instance how long a contact is closed for.

1xDOL: (Direct On Line starter macro)





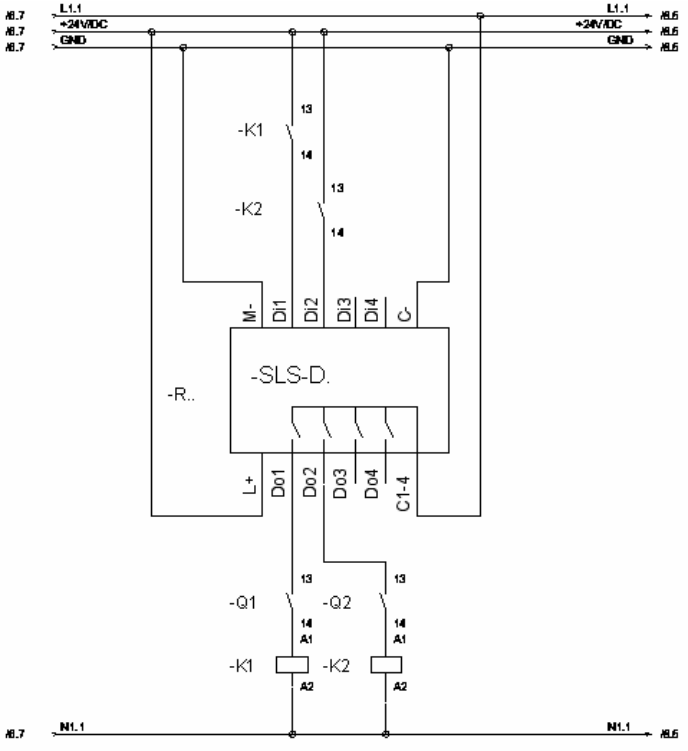


If a DOL-output is set or reset, there must be a feedback signal after 50 ms. Two internal „flags“ with addresses Dol 1ON & Dol 1Err are automatically written into the program in order to connect an output or a failure warning. It is therefore possible to debug failures. Object 1xDOL uses Do1 as a DOL-output, input Di1 is awaiting a feedback signal.

If a 1xDOL Macro is loaded to a 4 input, 3 output, half SLS-86 local module, there are 3 inputs and 2 output free for use in the program.
If a 1xDOL Macro is loaded to a 4 input, 4 output extension module, there are 3 inputs and 3 output free for use in the program

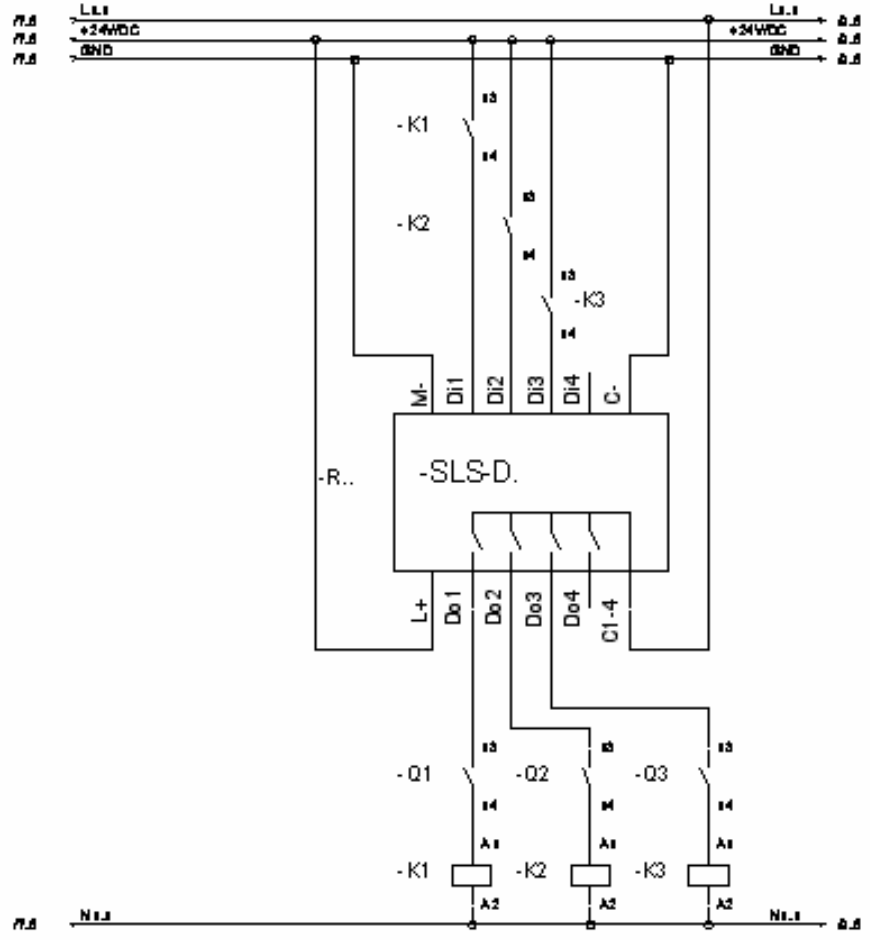
2xDOL: (Direct On Line starter macro)

Compared to the 1xDOL macro described on the previous page, because the 2xDOL uses Do1 and Do2 there are only two free outputs available. (1 on a half SLS-86 local module) Also as both Di1 and Di2 are awaiting feedback there are only 2 free inputs available.

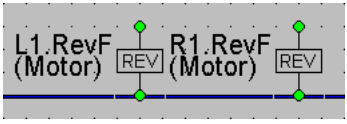


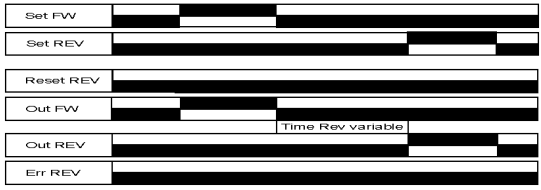
3xDOL: (Direct On Line starter macro)

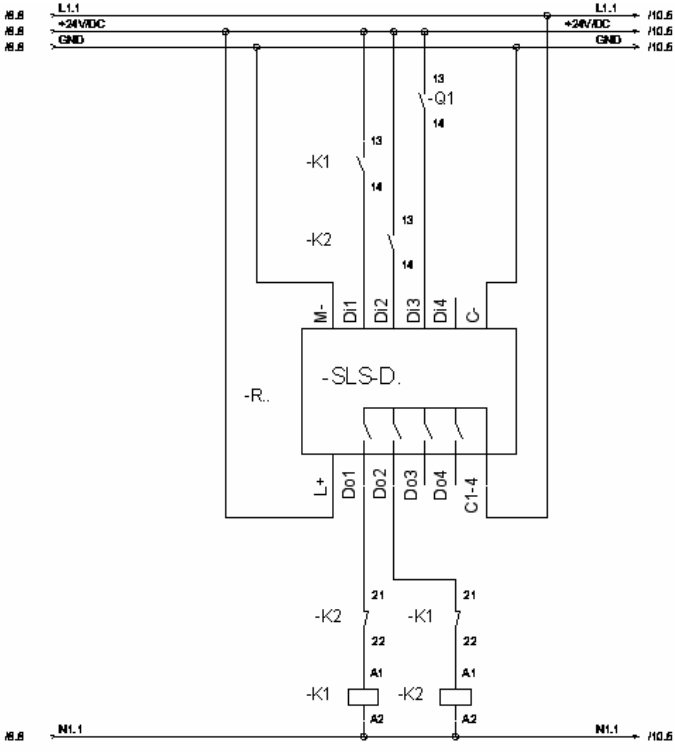
The 3xDOL Macro uses Do1, Do2 and Do3 as outputs and Di1, Di2 and Di3 as inputs. This leaves one free input and one free output. (no free outputs on a half SLS-86 local module)



FWD / REV: (Reversing contactor macro)

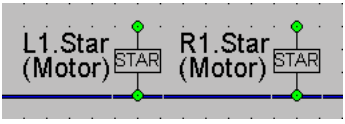


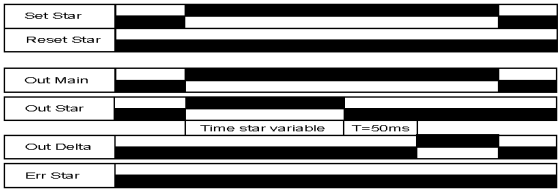


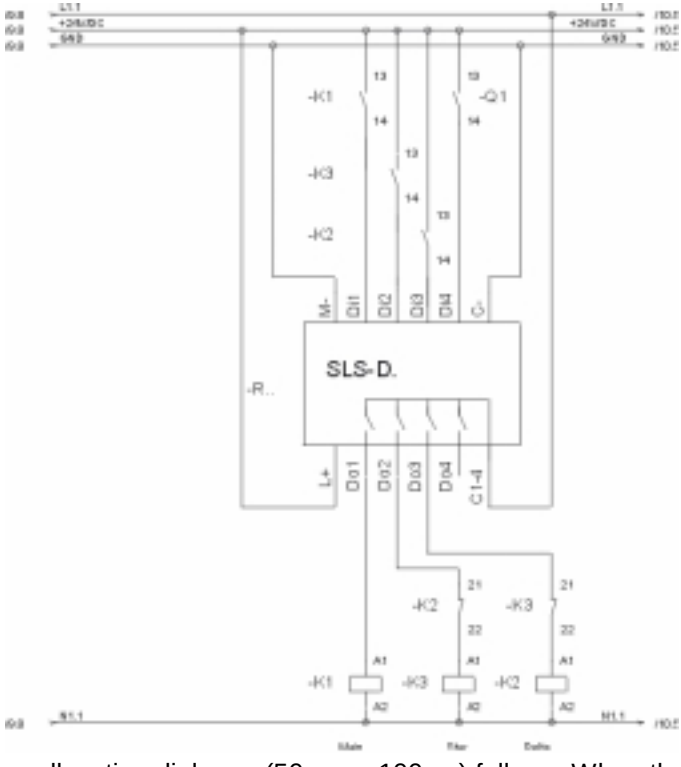


Similar to the DOL macros described on the previous pages the FWD/REV macro also requires feedback on the inputs (Di1 and Di2) (50ms).
If the FWD-output is activated and set the „flags“ RevFOn and RevFERR which are automatically loaded into the program with the macro.
If you switch from FWD-output to REV-output, the REV-output will be set after a suitable delay, which is defined in the allocation dialogue. The two „flags“ (RevRON and RevRERR) which are also automatically loaded into the program with the macro will be available for use in the program.
„Flags“ with the extension ON mean a successful execution of the function, „flags“ with the extension ERR show a failure in your function.

STAR - DELTA: (Star-Delta starter macro)







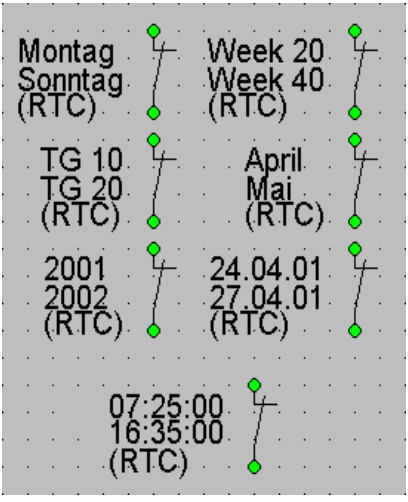
The Star-Delta macro is intended for Star-Delta start applications.

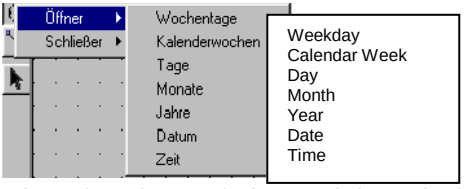
The macro uses 3 outputs (Do1, Do2 and Do3), which also require feedback on the inputs. When the Star-delta function is activated, the outputs OutMain and OutStar will be set.

When the Star Time, which is defined in the in the allocation dialogue, expires the OutStar-output will be reset.

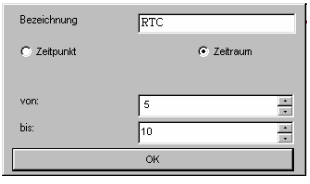
The Dwell Time which is also adjusted in the allocation dialogue (50ms or 100ms) follows. When the Dwell Time expires, the OutDelta-output will be set. „Flags“ are also automatically loaded with this macro and are available for use in the program.

Real-time-clock





Time functions of the real-time-clock can be integrated into the wiring diagram as normally open or normally closed contacts. You can define the switching function as a point in time (switch on at X time/day/date etc)) or as a time interval (switch on between X and Y times/days/dates etc)
The switching time or time interval setting is selected in the output allocation dialogue.



RTC time function ranges

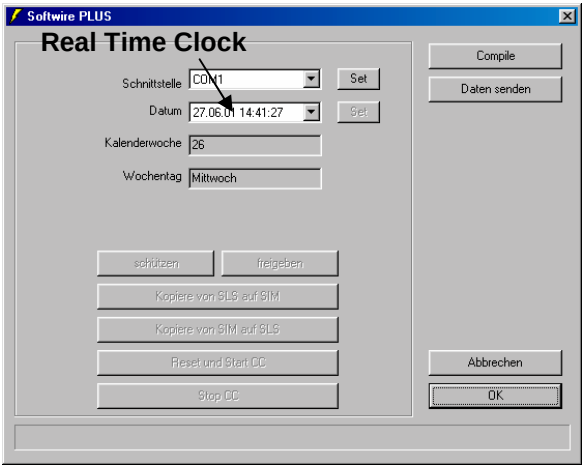
Weekdays	Monday - Sunday
Calendar week	1 - 52
day	1 - 31
month	January - December
year	2000- 2099
date	01.01.00 – 21.12.99
time	00:00:00 – 23:59:59

Connections

All program elements which are selected from the tool bar or from the menu, and placed into the work space, must be connected according to the relevant standards. Each path has to be a complete circuit. If the elements are not connected you will get a failure message.

Output program data dialogue

Click the output data dialogue button in order to open the dialogue.
( )



On starting the dialogue with an SLS-86 module connected to the COM port of the PC you will see the real-time-clock adjustments. If you get the message: „a communication problem has occurred“, there is a communication failure. Should this happen, choose another port or check the wiring to your device.

Output data dialogue options:

- **Compile:** compile the program you have created
- **Send data:** transmit data to the SLS-86
- **Stop CC:** stop program on the SLS-86 from running
- **Reset and Start CC:** reset and restart the program on the SLS-86
- **Copy from SLS to SIM:** copy the program from the SLS-86 RAM to the memory card (ensure card loaded in cassette)
- **Copy from SIM to SLS:** copy the program from the memory card to the SLS-86 RAM
- **Save and release:** adjust the memory card

First steps

This chapter describes how to use the work space step by step.

Application example

Please note that although all Windows and workspace menus in the following example are in German text, the text will automatically change to whichever language you select when starting to create your project.

To implement the simple control of a roller shutter door with delay time between the opening and closing. The following functions shall be integrated:

- The „Open door“ output (Do1) is activated when the „Door closed“ limit switch (Di2) is closed and the „Open Door“ push button (Di1) is pressed or when the door is closing and the push button (Di1) is pressed (delay time).

- The „Close Door“ output (Do2) is activated when the „Door open“ limit switch (Di3) is active and the push button (Di1) is pressed.

- When the stop push button (Di4) is pressed, the door has to stop instantly. After releasing the stop push button the door is to roll down to the door closed limit switch and await for the next activation of the „open door“ push button.

A step-by-step guide to programme the above specification follows.

Step 1: Create a project and define its name

As a first step click „create new project“.

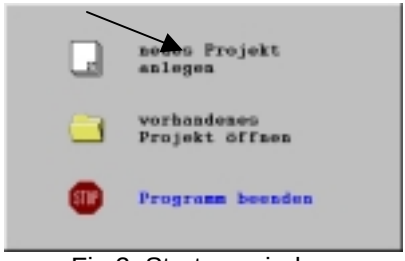
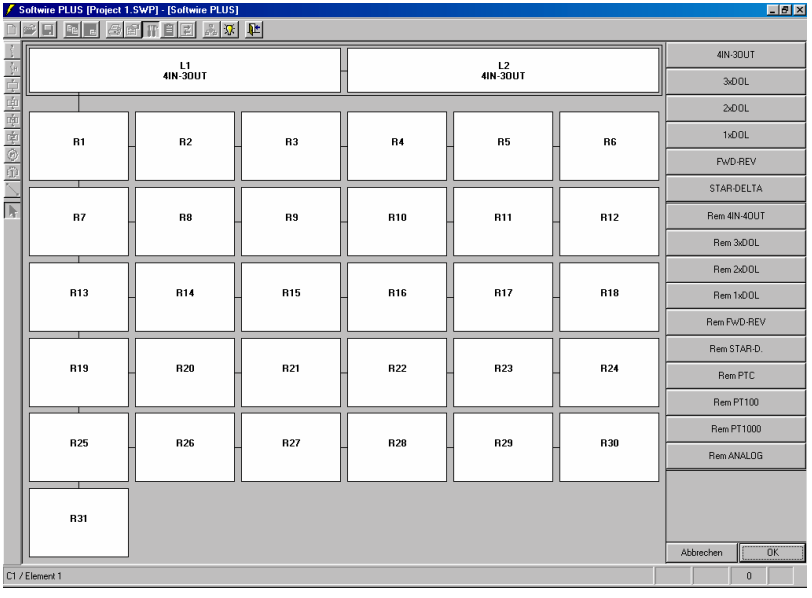


Fig 2: Start up window

The hardware configuration menu opens.



As the module allocation is correct (no extension modules are required), please click „OK“ to close the menu and open the work-space.

When performing these steps a free work space, and a file to store the project data is created. If a different project name is required open the „project“ menu and choose „save as“, a window called „save under“ will open. Type the required name into the text line and click the button „save“.

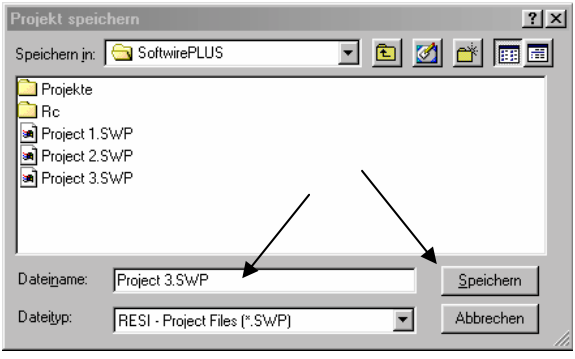


Fig 3: Save project

Step 2: Place elements into the working space

The project software drawing can now be created by placing the various elements into the work space. The application specification has four input values.

Di1....“Operate Door“ push button (Open and Close door)
Di2....“Door closed“ limit switch
Di3....“Door open“ limit switch
Di4....“Stop“ push button

The inputs should be placed into the program first. You may select either a normally open contact which represents a contact that closes (makes) when it is operated, or a normally closed contact that opens (breaks) when it is operated.
Click on the required symbol in the toolbar, choose a „Normally open contact“ from the drop down menu and place this element on the work space (drag and drop).

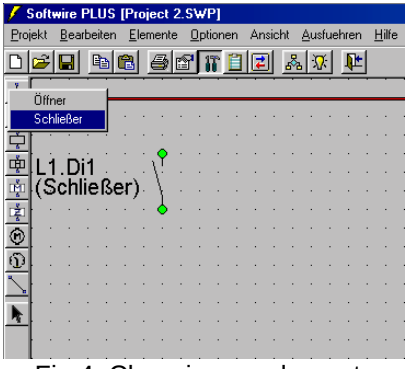


Fig 4: Choosing an element

Depending on the selected element a window (Fig 5) will appear. Alternatively double-click a recently placed element and the same dialogue opens. The allocation (description) of the element can now be entered.

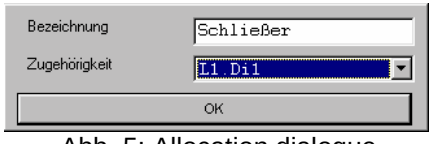


Abb. 5: Allocation dialogue

The other inputs have to be executed as normally closed contacts and are defined as L1.Di2, L1.Di3 and L1.Di4. (**L**ocal **1**.**D**igital **i**nput **2, L**ocal **1**.**D**igital **i**nput **3, L**ocal **1**.**D**igital **i**nput **4**)

Defining an output as the result of a switching combination is as easy as placing an input on the work space.
From the toolbar choose the symbol for a relay (see fig 4). A menu appears from which an „output“ can be selected. This output is then placed on the work space. The properties of the output (description and allocation) can be entered.

The 4 outputs are named L1.Do1, L1.Do2, L1.Do3 and L1.Do4.

Step 3: Connecting various elements

The connection of several objects is easy. Select the Line tool from the tool bar. Then click onto the green connection point of the first object and drag to the connection of the second object. A line will be drawn connecting the two points.

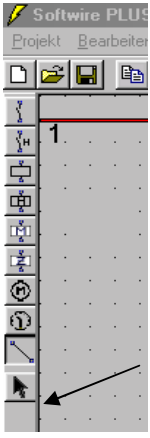


Fig 6: Line tool

You should now see the following on your screen:

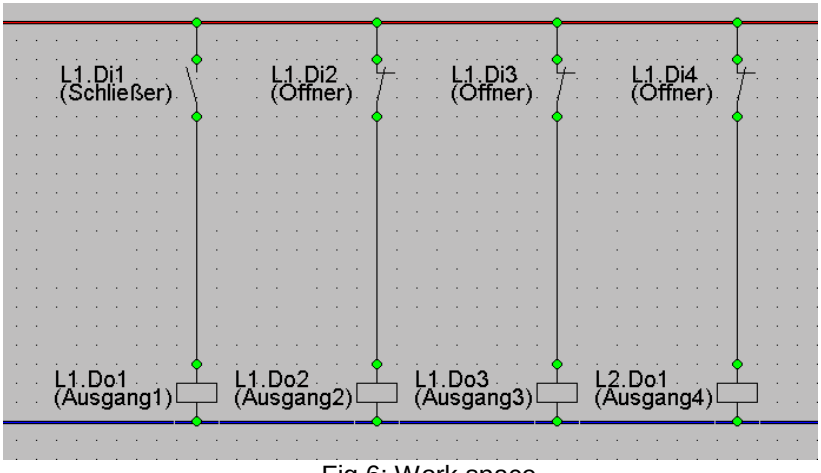


Fig 6: Work space

This program could be downloaded to the SLS-86 and the outputs would operate depending on the input status, however in relation to the application it is meaningless and the specifications are not fulfilled.

Step 4: Delete elements

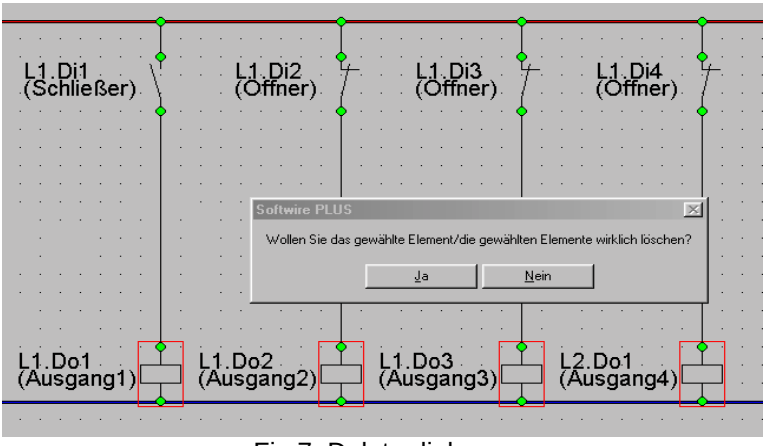


Fig 7: Delete dialogue

Select the outputs as shown above and delete them. Next replace the four deleted outputs with Marker (internal) relays. The reasons are a) to use specific properties of the marker logically and b) to be able to use the properties of the inputs which activate the markers at multiple places in the program if required by adding additional contacts to the markers..

Consider the application specification. The digital input Di1 is responsible for both closing and opening the door. Therefore a marker is required which is reacting to a rising impulse (leading edge)-e.g. push to start, push to stop. Choose the corresponding symbol from the tool bar. (Click on the marker symbol, select rising impulse) All other relays are replaced by ‚normal' markers.

The conditions of the markers must now be combined, starting with the „open door" path (refer to fig 8).

Consider the conditions that must be met to open the door – Marker 1 and Marker 2 must be switched, Marker 3 and Marker 4 must not be switched. A „self-holding" or „latching" contact has to be installed. (Marker 5 in fig.8)

When the above conditions are met Marker 5 will be activated. The normally open contact of marker 5, in parallel with markers 1 & 2 becomes a "self-holding" or "latching" contact. This must be integrated in order to hold the action of the 'rising impulse' marker M1 until the 'Door Closed' limit switch Di2 or the 'Stop' switch Di4 is activated, thus stopping the door.

Step 5: Create path 1

Example of logic structure:		**Actual function**
Marker 1 ..... True		Operate (open) door
and		if
Marker 2 ..... True... or Marker 5	True	Door is closed
and		and
Not Marker 3 ..... True		Door is not fully open
and		and
Not Marker 4 ..... True		Stop button is not operated

Equals (energise) Marker 5

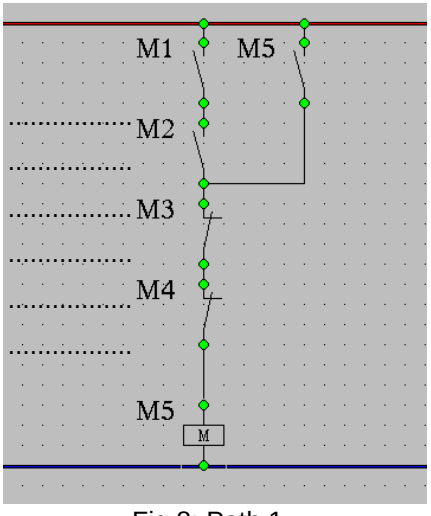


Fig 8: Path 1

Reminder:

M1 = Operate Door (Open /Close)

M2 = Door Closed limit switch

M3 = Door Open limit switch

M4 = Stop button

M5 = see Fig13 on P40

Fig 8 shows the result of the previous considerations.

You can easily prove this path;

Temporarily program any free output in series with the normally open contact of M5 (parallel to NC contacts M3 & M4 and Marker M5), to simulate the door motor. Download the program to SLS-86 and 'operate' the program. – see Step 11 on P72 for downloading instructions.

Once you are satisfied that the path operates as required, delete the output you added and proceed to step 6.

Step 6: Create path 2

The „close door“ path must now be considered.

When the door is open, normally open contact M3 (open limit switch) will be closed. Operating the Close/Open input DI1 will close normally open contact M1, the circuit will be complete through normally closed contacts M2, M4 & M5, therefore marker M6 will energise. The normally open contact of M6 in parallel with contacts M3 & M1 will latch M6 until any of the normally closed contacts M2, M4 or M5 open.

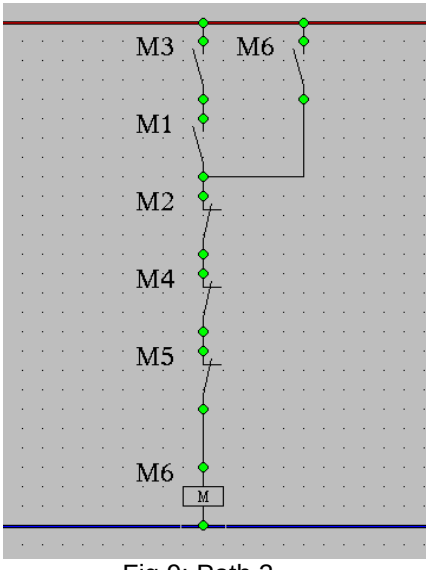


Fig 9: Path 2

You could stop here to prove your circuit as before if required

Now the results of the paths will be used again, first the timing function has to be considered: In the tool bar click the „relay“ symbol select „delayed“ and choose the „On-delay“ function from the menu, place the time relay and configure it. The configuration dialogue is similar to the other symbols, however the timing features are additional (Fig 10)

Step 7: Configure timing functions

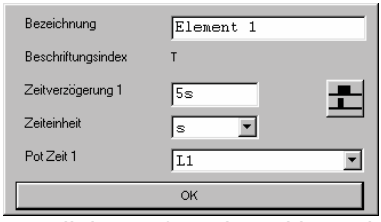


Fig 10: Property dialogue for relay with on delay function

To define the delay time there are two possibilities:

- ❑ Fix the time in the program by typing the figures into the box.
- ❑ Use a variable time by allocating the timer to one of the external potentiometers.

Step 8: Allocate potentiometer

Right-click the appropriate symbol in order to get to the allocation dialogue (Fig 11). Here you can define the time, the duration of the delay and the allocation to Pot 1 or Pot 2 potentiometer. If you allocate to a potentiometer the adjusted time is the accumulated value.

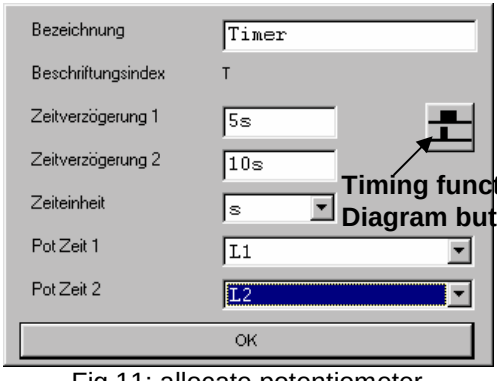


Fig 11: allocate potentiometer

Step 9: Timing diagram

To check the timer function you can look on the function diagram. Just click the button on the diagram (Fig 11).

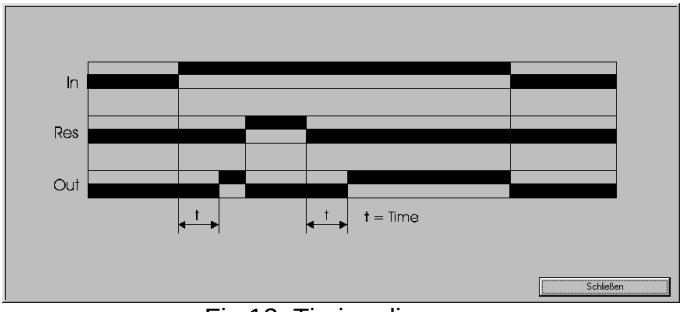


Fig 12: Timing diagram

Step 10: Draw results of the combined timing and marker functions`

Once the timer is defined and configured it can be integrated into the circuit. The result is a combination of timing functions with marker functions (Fig 13).

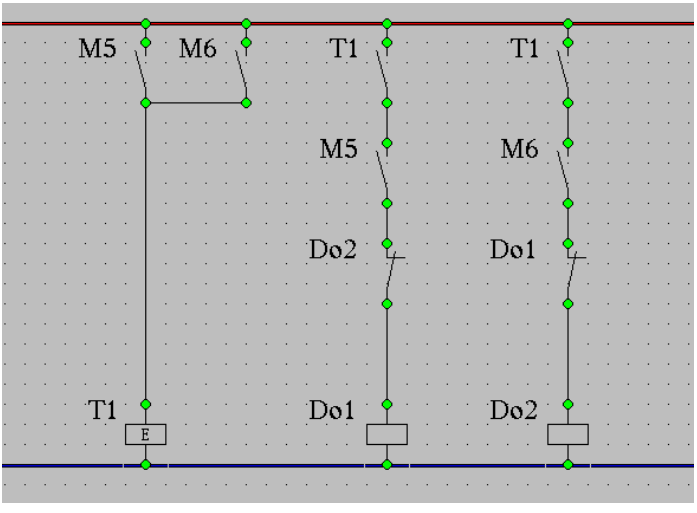


Fig 13: Result of the combination

Step 11: Download

To execute the program, the program has to be assembled and downloaded to the SLS-86. Click the button on the top toolbar with horizontal blue and red arrows to get to the output data dialogue (Fig 14).

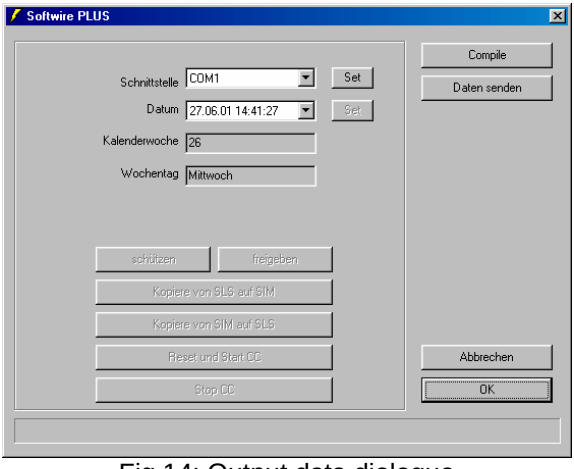


Fig 14: Output data dialogue

If the connection cannot be made, the following message will occur (Fig 15).

Fig 15: communication failure

By clicking the button „Compile“ the code will be generated from your drawing and by clicking „Send data“ the code will be transmitted to the device. If there is no failure message, your program will be ready.

TERM4

This chapter deals with the operation of the product group SLS86 by using the text display TERM4.

Physical Connection

The cable for the physical connection of Term4 to SLS is supplied with the Term4. Connect the „SLS“ marked cable end with the „Config“ input of the module SLS86. Then connect the „TERM4“ marked end with the display. As the „Config“ input is also used for programming the application, module SLS86 has to be programmed (Transfer application from PC to module) before operating with TERM4.

Communication parameter

Configure the text display as follows:

```
Baudrate:   19200 8N1
CommMode:   Protected
```

Refer to the Term4-Manual for details about adjustment opportunities.

Menu

After activating the system a short message and afterwards the start display will occur:

```
+SOLUTION SLS-86
USE ✓ to select,
←→ to navigate
© 2001 by HIQUEL
```

Navigate to the following menus by pressing the keys: ← and → :

```
A.STATUS SLS-86
B.REAL TIME CLOCK
C.TIMERS
D.COUNTERS
E.RUN/STOP
F.HOSTSWITCHES
G.HOSTRELAIS
H.TEXT LIST
```

Choose the preferred menu with ✓ , by pressing × you can leave the chosen menu.

A. Status SLS-86

The status of the inputs and outputs of modules L1 and L2 will be displayed:

Line 1: inputs L1, inputs L2, outputs L1, outputs L2
Line 2: Voltage at L1.Di1, Voltage at L1.Di2
Line 3: Voltage at L1.Di3, Voltage at L1.Di4
Maximum displayed voltage value is 10V, but you can also connect the L1-inputs with 24V.
Line 4: L1.Pot (%), L2.Pot (%)

B. Real Time Clock

Choose the following menus:

`B.1.SHOW DATE&TIME`
Displays RTC-data.

`B.2.CHANGE TIME`
Bring the cursor into the right position by using the ← and → keys. Choose the preferred value with the keys ↑ and ↓ . Confirm the configuration with ●. This adjustment is identical with every menu.

B.3.CHANGE DATE

B.4.CHANGE DAY

B.5.CHANGE WEEK

C. Timers

Choose the preferred timer with ← and → . The second line of the menu shows the status of the corresponding timer, the third line shows the "Description". To edit a value press ●. If one timer has two separate allocations, you will have to press ● again.

D. Counters

Choose the preferred timer with ← and → . You can also adjust the following functions:

Key ↑: increment counter
Key ↓: decrement counter
Key ●: Load counter with value = 0 (reset)

E. Run/Stop

Two menus can be chosen:

E.1.STOP PROGRAM
Stop the application by pressing ●.

E.2.START PROGRAM
Start the application by pressing ●.

F. Host switches

Choose your preferred object with the keys ← and →. The key ● activates or deactivates the corresponding switch. The second line shows you the binary status of the switch, line 3 shows the “Description”.

G. Host relays

Navigation corresponds to the previously described objects, the second line shows the status and line 3 shows the “Description”.

H. Text List

The „Description“ of the last three messages will be displayed here.

Notes:

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